

Chairman of Frick Dies in Baltimore

WAYNESBORO, Pa.—Abraham O. Frick, chairman of the board of the Frick Co., manufacturer of industrial and commercial refrigerating machines, died April 20 in a hospital at Baltimore.

Mr. Frick had been active in the affairs of the Frick Co. for 60 years. Born in Ringgold, Md., June 16, 1852, he was educated in the public schools of Waynesboro, where his father moved in 1861. At the age of 15 he began work as an apprentice in the Frick shops, serving in turn as foreman, draftsman, and engineer.

In the early 80's Mr. Frick made the drawings for the original refrigerating machines which the firm introduced in this field. In 1885 he became a charter member of the American Society of Mechanical Engineers, and has the distinction of being a member continuously for nearly 50 years.

In 1896 Mr. Frick became vice president and in 1904 was elected president of the Frick Co. Since 1924 he has been chairman of the board.

Electrolux Opens Home Service Department

NEW YORK CITY—An Electrolux home service department has been opened at the offices of Electrolux Refrigerator Sales Co. at 51 E. 42nd St. here under the direction of Jane Tiffany Wagner.

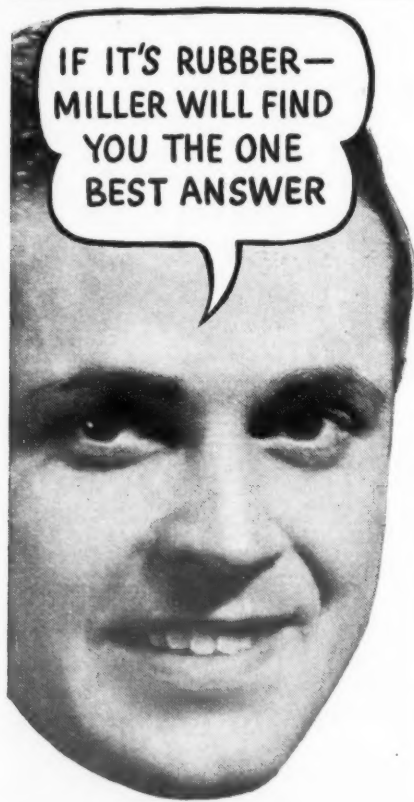
The home service headquarters has been equipped with model kitchen and conference rooms.

Piatt Water Heater to Sell for \$79.50

LANSING, Mich.—Retail price of the new Piatt automatic oil burning water heater has been set at \$79.50, according to an announcement made last week by John L. Gillen of the sales department.

Ferro Issues Booklet on Porcelain Enameling

CLEVELAND—A booklet entitled "An Ancient Art Becomes a Modern Industry" is being distributed by Ferro Enamel Corp. The book deals with the history of the development of porcelain enameling.



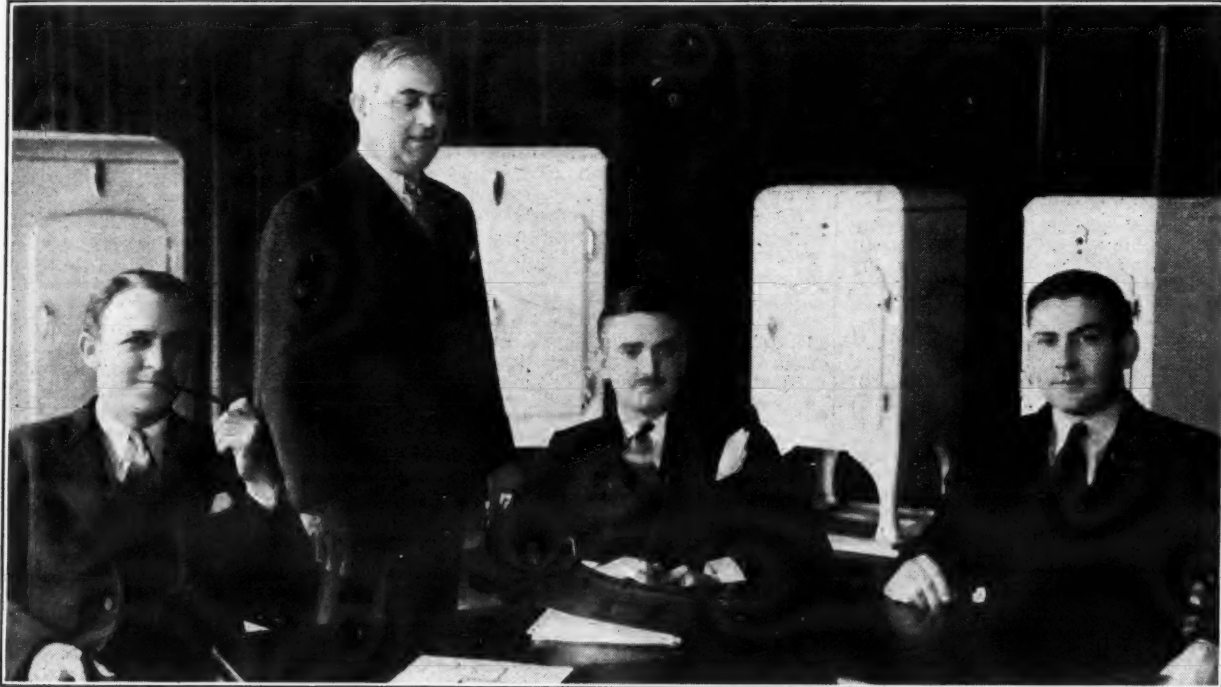
Special Service on SPONGE RUBBER PARTS

TEN years of close cooperation have made Miller's technical staff part of the electric refrigeration industry. We know your problems. We have helped solve many of them. Sponge rubber, for instance. Improvements developed by Miller are performing valuable service for leading manufacturers, in new uses of sponge rubber. Our consulting service is yours for the asking. Just write Miller Rubber Products Co., Inc., Akron, Ohio.

OUR EXPERIENCE
WILL SAVE YOU
TIME AND MONEY

Miller

A New Distributor Joins the Gibson Family



Frank S. Gibson, Jr., vice president of Gibson Electric Refrigerator Corp. in charge of sales, signs up the Schuster Electric Co. of Cincinnati as a distributor for Gibson electrics. Left to right: Allen Church, Gibson advertising counselor; E. D. Jacobs, Gibson assistant general manager; Mr. Gibson; and John E. Schuster.

Detroit Company Buys Zerozone Inc. To Operate Firm

(Concluded from Page 1, Column 1)
clared. In the meantime Mr. Jernberg has established temporary headquarters at the former plant at 939 E. 95th St., Chicago.

Work has already been started on drawing up specifications for new household and commercial refrigeration equipment, Mr. Jernberg declares, and announcement of the new models will be made early in May.

Other personnel of the reorganized Zerozone company, announced by Winslow-Baker-Meyering, includes the following:

Rudolph Berg, assistant sales manager and head of the order department; Perry Hall, chief engineer in charge of tests; George Lindgren, production engineer; and P. A. Lovgren, purchasing agent.

All of these men were formerly connected with Zerozone, Inc.

Norge to Have Oil Burner Ready May 1

(Concluded from Page 1, Column 1)
Norge oil burner is the manner in which the blast tube is rifled to secure "progressive rotation" of the air necessary to efficient atomization.

Unlike a gun barrel, the rifling in the blast tube of the Norge oil burner is raised rather than indented, the spiral relief growing more pronounced as the rifling progresses toward the outward end of the blast tube. This makes possible a controlled and dependable progressive rotation of the air without the use of any complicated "gadgets."

Other features of the Norge burner are spring mounted motor and pump and spring coupling pump drive, flame control, and easy accessibility of parts.

The Norge oil burner will be available in three models, capable of taking care of combustion needs from half-gallon per hour requirements in smallest homes to the 16-gal. per hour requirements of large industrial installations. One Norge model, having a 3-gal. capacity, will serve 85 per cent of all domestic installations, officials of the oil burner division declare.

Nome to Handle Trupar Commercial Line

DETROIT—Nome Refrigerator Corp., assembler and distributor of electric refrigerator equipment here, has been named exclusive dealer in the Detroit metropolitan territory for Mayflower commercial refrigeration and air-conditioning equipment, according to officials of the W. C. DuComb Co., Inc., distributor for Mayflower.

Sales of the Mayflower equipment by Nome will be under the direction of Harry Lee, formerly in charge of refrigeration sales for Morley Bros., wholesale hardware house and distributor of electrical appliances.

Orlando, Fla., Plans 1936 World's Fair

ORLANDO, Fla.—Preparations are now under way by a local committee for a 1936 World's Fair to be held here.

N. P. Yowell, president, Yowell-Drew stores, heads the enterprise.

Batavia Folder Shows Kold-Hold Bodies

BATAVIA, Ill.—Batavia Body Co. has just issued a new illustrated folder featuring the application of Kold-Hold refrigeration in Batavia refrigerated truck bodies.

Wellington Resigns As Rempe Chief Engineer

CHICAGO—E. P. Wellington, formerly chief engineer for the Rempe Fin Coil Co., has resigned his position to form his own business, he announced last week.

Norge Ships 19,998 Units During March

(Concluded from Page 1, Column 4)
have come in so fast that at the close of business on March 31, open orders practically equalled shipments for the month.

"Orders received since Jan. 1 are equivalent to nearly 60 per cent of the corporation's entire 1933 production, and there is no apparent slackening in demand. Every indication points to continued capacity operation of our plants for several months to come, and a total volume for the year at least double that of 1933.

"Many Norge distributors have already ordered in excess of their total 1933 requirements. Export orders have likewise exceeded those for the entire preceding year.

"The present wage scale in our factories is higher than in 1928 and 1929, the boom years in American industry."

'House of Tomorrow' Is G-E Equipped

CLEVELAND—The Cleveland "House of Tomorrow" opened here recently on the eighteenth floor of the Builders Exchange building by Building Arts Exhibits, Inc., is General Electric equipped throughout.

Building Arts Exhibits, Inc., is an enterprise which was launched about two years ago for the purpose of providing the building industry with facilities for a joint presentation of its products to the consumer.

In the kitchen of the house of tomorrow are the G-E appliances—deluxe refrigerator, range and dishwasher, and various small appliances.

Both winter and summer air conditioning is provided by G-E air-conditioning units.

TO DEALERS LOOKING FOR MORE PROFIT!

Alert refrigeration dealers have discovered a profitable local market for the sale of *Taylor Counter Ice Cream Freezers*. That's why the Taylor factory is flooded with orders. Dealers are beginning to see local drug stores, confectioneries, hotels, institutions, etc. as profitable prospects for the Taylor Freezer.

Besides the profit on the Freezer itself, the dealer realizes an extra profit from the refrigeration machine that goes with it. *It is this two-way profit that makes the Taylor franchise attractive.*

Taylor Freezers are trouble-free and require no service. They are made in sizes that satisfy all requirements. They sell on the "pay-for-themselves" appeal.

Taylor manufactures ice cream freezers exclusively . . . which results in unequalled quality and price.

DEALERS! - -

There are many profitable Taylor Freezer sales opportunities in your territory.

Write or wire today for details on the Taylor Freezer Franchise which gives you protection for your territory. We do not sell direct to your customers. We help you sell them and you get all of the profit.

When you see the Taylor Sales Plan you will understand why other dealers are making us speed-up production.

Taylor equipment is used with all refrigerating machines.

Taylor Freezer Corporation

Beloit, Wis.



REFRIGERATION NEWS

Registered U. S. Patent Office

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DETROIT, MICHIGAN, MAY 2, 1934

Entered as second-class
matter Aug. 1, 1927THREE DOLLARS PER YEAR
TEN CENTS PER COPY

Three O'Keefe & Merritt 1934 Models Styled

Prices Start at \$119;
Many New Features
Are Added

LOS ANGELES—Three largest models in the new O'Keefe & Merritt six-model 1934 line of household electric refrigerators have styled cabinets, with rounded corners, paneled doors, and gracefully arched leg pieces.

Prices on the O'Keefe & Merritt line this year start at \$119 (delivered and installed). The three smallest models do not have the styled cabinets.

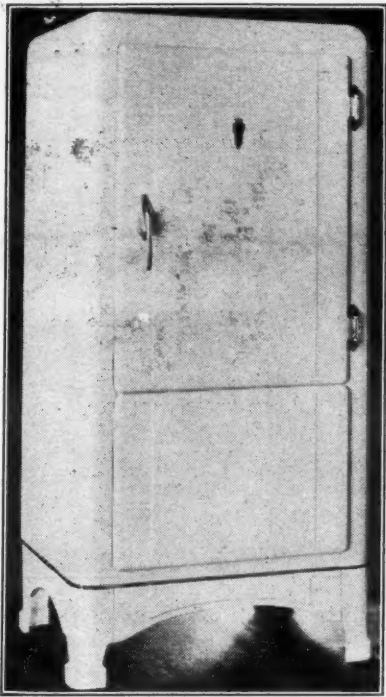
The three styled cabinets have a number of extra convenience features in the form of a built-in thermometer, interior electric light, sliding shelf, drawer-type vegetable freshener, double-depth dessert tray, porcelain door-protected ice compartment, rubber ice cube tray, and automatic ice tray release.

Hardware on these models is chrome-finished, semi-concealed.

Other features which are standard on all models are flat bar food shelves, center mounted all-porcelain evaporator.

(Concluded on Page 2, Column 5)

Beautified



Streamlining in three models is a feature of O'Keefe & Merritt's 1934 household line.

Carrier Adds 2 Store Coolers & 3 Freon Units

More Than 100 Dealers
Now Handle Smaller
Installations

NEWARK—Introducing two new Store Weathermakers and three new Freon condensing units in 5-, 7½-, and 10-hp. sizes, Carrier Products Corp. has just announced the 1934 line of air-conditioning equipment which Carrier dealers will offer this year.

The Carrier dealer group which handles commercial refrigeration and small air conditioning, as distinguished from the Carrier district offices which direct large contract installations, has been expanded during the past year to include well over a hundred independent merchandising organizations throughout the country.

The new Store Weathermakers are designated as models 39L and 39M, the first a vertical unit, the second horizontal. They are built for complete year 'round air conditioning. Each is built in a sectionalized design with four available sizes, permitting a range of cooling capacities from about 2 to 32 tons of refrigeration.

Fan, coil, drip pan, and filter box sections are built of pressed steel and welded construction, with removable doors providing access to internal elements.

The fan section is designed for assembly to the coil section in several

Sparton and Jomoco Join Refrigeration Division of Nema

NEW YORK CITY—Sparks-Withington Co. of Jackson, Mich., manufacturer of Sparton electric refrigerators, and Jomoco, Inc., subsidiary of Johnson Motor Co., Waukegan, Ill., manufacturer of Jomoco electric refrigerators, have been admitted to membership in the Refrigeration Division of National Electrical Manufacturers Association, according to an announcement made recently by the membership committee of Nema.

Specifications To Be Revised

A final revision of the specifications for all models of all makes of household electric refrigerators will be published in the May 30 issue of the News in response to the demand from hundreds of subscribers. Please send orders for extra copies with remittance (10 cents per copy) so that the required press run may be determined in advance.

Government Survey to Show Saturation in 60 Key Cities

WASHINGTON, D. C.—Preliminary returns from the nation-wide Real Property Inventory conducted by the Bureau of Foreign and Domestic Commerce have been released recently by Willard L. Thorp, director of the bureau.

While the first report covers only one city, Casper, Wyo., data will soon be available for more than 60 other cities, representing every state. The individual city reports will be released as rapidly as data can be tabulated.

Of chief importance to the refrigeration industry is an actual count of the number of household refrigerators in use. According to the report, 813 household refrigerators are in operation in Casper, a city of 16,619 population. Wired homes are reported at 5,108, indicating that refrigerator saturation is about 16 per cent in that city.

The first report gives indication of the data which soon will be available to industry in gauging sales campaigns for repairing, modernizing, rebuilding, and installing of modern conveniences.

The Real Property Inventory was organized as a unit of the Bureau of Foreign and Domestic Commerce and financed with funds from the Civil

(Concluded on Page 24, Column 3)

Leonard Announces Increase in Prices

DETROIT—Increases in the retail installed prices of its household electric refrigerator models and advances in list prices on its water coolers were announced last week by Leonard Refrigerator Co.

Advances in the prices of the household models range from \$2.75 to \$21. The increases for each model (for territorial zone 1) are as follows: FL-1, \$11; FL-15, \$7; FL-2, \$4; FL-3, \$12; LD-2, \$15.50; LD-3, \$21; FT-2, \$13; TD-2, \$13; TD-3, \$14; TD-4, \$12.50.

Models FT-2, TD-2, TD-3, and TD-4 have porcelain exteriors. The

(Concluded on Page 2, Column 5)

New Train Will Have York Air Conditioning

YORK, Pa.—Air-conditioning systems manufactured by York Ice Machinery Corp. are being installed in the new high-speed Diesel-electric train of the Chicago, Burlington, & Quincy Railroad, which has been under construction for the past several months at the plant of the Budd Mfg. Co.

The new train, which represents a departure from conventional designs in railway passenger equipment, comprises three cars, permanently coupled to form what is known as a completely "articulated" train, the total weight of which is only 80 tons, as compared with an average weight of 400 to 500 tons for steam

(Concluded on Page 11, Column 1)

Westinghouse' New Series Has 7 Dulux Models

'Handy Tray' Inside Door
& Refrigerated Shelf
Are New Features

MANSFIELD, Ohio—Refrigeration department of Westinghouse Electric & Mfg. Co. this month is introducing its new "C" line of household electric refrigerators with exterior finishes in both porcelain and Dulux and which includes (in the larger models) a new convenience feature in the form of a "Handy Tray" mounted on the inside of the door.

Models in the new line range in capacity from 4.2 net cu. ft. to 9.2 net cu. ft. Prices start at \$134.50.

All models in the "CL" series of the new line are finished in Dulux. Prior to the application of this finish on the Westinghouse refrigerators, the cabinets are subjected to a cleaning operation known as the "bonderizing" process, which is claimed to preclude the possibility of the spread of rust in case the finish should be accidentally damaged.

The "Handy Tray" is standard equipment on the three larger models in the "C" line. This tray stands flush on the door when not in use, drops into a horizontal position at a

(Concluded on Page 2, Column 4)

Salesmen's Group Adopts Constitution

NEWARK—The National Commission Salesmen's Association met here April 16 for the purpose of ratifying the constitution of the organization, to elect a board of directors and two general officers.

In response to a request from the distributing trades section of the National Recovery Administration, a committee has been appointed to appear early in May before an NRA hearing for salesmen.

The two officers elected at the meeting were Edward Josay, Hackensack, N. J., general secretary; and R. A. Hey, Bogota, N. J., treasurer.

(Concluded on Page 2, Column 1)

John Wyllie Appointed Temprite Sales Chief

DETROIT—John Wyllie, formerly chief of the sales engineering department of Kelvinator Corp. and one of the industry's best known engineers, assumes new duties this week as general sales manager of Liquid Cooler Corp., manufacturer of Temprite beverage coolers, according to an announcement made by William R. Clark, Liquid Cooler Corp. general manager.

Mr. Wyllie's first connection with

(Concluded on Page 3, Column 1)

Valve Incorporates Full Flow Passages

DETROIT—I. J. Knudson of the Detroit Lubricator Co. announces production of a new, large size expansion valve. The new valve operates on the thermostatic principle similar to the company's standard No. 673 thermostatic valve, but several novel features are incorporated. The valve is known as the No. 785.

The No. 785 valve will be furnished with 5/16-in. orifice, and has full flow passages so that no restriction occurs on either the liquid side before the orifice, or the low-pressure side after leaving the orifice.

According to Mr. Knudson, several early samples of the No. 785 valve

(Concluded on Page 16, Column 1)

No Bids, So Majestic Sale Is Postponed Again

CHICAGO—No bids were submitted for the complete refrigeration business of Grigsby-Grunow Co., manufacturer of Majestic radios and refrigerators, which was offered for sale by the creditors' committee Monday morning here, according to A. L. Schapiro, attorney for the trustee, and the sale was postponed until Thursday morning, May 3.

One bid was received Monday for a portion of the plant equipment, but Mr. Schapiro is recommending that it be refused. It was from Samuel C. Horwitz, a Chicago attorney, for \$350,000.

24 Air Conditioners In Kelvinator Line

DETROIT—Kelvinator Corp. is offering 24 models of air conditioners in two main types—those affording automatic temperature control by means of a room thermostat and other units providing both temperature and humidity control by means of a room thermostat and a room humidistat. Both these main types are available in either the self-contained, the floor type, or suspended form of unit.

The self-contained, floor type and eight of the suspended type units may be equipped with heating coils and humidifying sprays to provide both winter and summer air conditioning.

Thermostatic expansion valves control the refrigerant in the floor type and suspended type. A high side float valve is used in the self-contained units.

The controlled dehumidification provided by the self-contained and floor-

(Concluded on Page 15, Column 1)

Fedders Develops Coils For Air Conditioning

BUFFALO—Introduction of a complete line of heating and cooling coils of large refrigeration tonnage capacities for use in air-conditioning units is announced by the Fedders Mfg. Co.

The new Fedders air-conditioning coils are a development of the heat transfer units which are used in commercial refrigeration installations.

(Concluded on Page 9, Column 5)

ROCHESTER, N.Y., DEALERS FIGHT TO OVERCOME BUYERS' HESITANCY

By Elston D. Herron

"Of course, this isn't like any other city."

For years, it seems, merchandisers of specialty products have agreed that Rochester, N. Y. foots the lists in willingness to accept anything new. Its people hold back, hesitate at buying anything that hasn't been on the market over a long period of years.

First time we heard it, the above quoted phrase failed to make much impression on us. But when it slipped into the remarks of a second, a third, and a fourth retailer there, we concluded that there must be something to it.

H. D. Smith Bets His Job He Can Sell 750 Units

Why is Rochester like that? Business men there will tell you that they don't know. But electric refrigerator merchandisers back up the statement by pointing out that saturation of their product in the city of 327,000 is only 14½ per cent.

But now there is a new refrigeration man in Rochester. His name is H. D. Smith. He is manager of Rochester Branch Sales, large Kelvinator dealership. And he thinks this stuff about there being a merchandising bogey is the bunk.

This former sales manager of the Bristol-Lite Co. in Syracuse told us, "I don't know why it should be true that a lot of refrigerators can't be sold in a town just because it happens to be one particular town, barring some economic catastrophe, and Rochester hasn't had that. During the depression it fared better than a good many places."

Mr. Smith came to manage the organization on March 18, and is betting his job that he can sell 750 Kelvinators before the end of 1934.

For two reasons, other refrigeration retailers in Rochester are watching Mr. Smith's work with interest.

First, because he doesn't mind telling them he thinks they're scared by something that doesn't exist.

Uses Coin Meter Plan To Close Sales

Second, because he is attacking the market with coin meters, on a "non-conversion" basis—that is, all his salesmen are strictly forbidden to try convincing a walk-in prospect that she should buy on a straight contract rather than the meter plan.

There are some types of outlets which can use the meter plan profitably, he believes, while its use by others is a definite mistake and may put them on the rocks. Here are some of his views:

"A large dealership, with ample capital, can afford to use the meter plan. It gets its profit out of volume. If the smaller outlets try to compete by using meters, too, there may be a general chaos throughout the whole industry."

"It is hazardous for a small dealer to use this plan because:

1. He can't afford the expenditure for an amount of advertising large

enough to bring prospects to his store in satisfactory numbers.

"2. He has to take on a larger sales organization than he can really afford, to take care of walk-in traffic attracted by the meter plan."

"3. If he makes extensive use of meters, he can't continue his house-to-house selling activities properly. And when that is discontinued, he has broken the backbone of the specialty sales business."

"4. Meter plans come under the heading of department store merchandising methods, and small specialty dealers never have been able profitably to adapt department store methods to their own operations."

"As soon as the smaller dealer goes back to straight contract selling, with shorter payment periods and more profit per sale, backed by a lot of bell-pushing, he will do as much business in the long run, and won't eat himself up in financing meter or similar plans."

"In other words, we are using one type of selling; the small dealership works best with another type. Gen-

erally, we get one type of prospect, while the specialty dealer gets another.

He makes his mistake by trying to compete with us with our methods. He would make plenty of sales if he would stay on his side of the fence and use his own type of selling."

Displays Placed in Food Stores

Mr. Smith believes his organization set-up to be almost ideal for use of the meter plan. Company headquarters and main showroom are located in a triangular building on West Main St. Most of the traffic in this store is "drive-up" trade. Mr. Smith said — prospects who drive to the showroom to see models advertised in newspapers. On East Ave. is a branch store, where the general shopping traffic is heavy every afternoon.

In Rochester are also four Wegman food stores, owned and operated

(Continued on Page 4, Column 1)

AIR CONDITIONING FEATURED THIS ISSUE. CIRCULATION 12,000 COPIES.

Salesmen's Group Adopts Constitution, Starts Survey in 92 Cities

(Concluded from Page 1, Column 5)
 Offices of the general secretary are at 161 Main St., Hackensack, N. J.

A questionnaire designed to determine the conditions that exist for salesmen in the specialty selling field, and especially in the refrigeration industry, has been sent to 250 commission salesmen in 92 key cities in the United States.

Preamble States Aims of Group

The following is the declaration to the constitution of the National Commission Salesmen's Association.

"We, the specialty salesmen of America, members of the National Commission Salesmen's Association, recognize the role we play in the present era of efficient quantity production and intensified sales methods by highly centralized industrial, commercial, and financial corporations; and,

"Whereas, we fully realize the economic importance and social significance of our profession as a medium for the distribution of the real wealth of the world; and,

"Whereas, we, the specialty salesmen, are dependent upon an uncertain remuneration, wholly or in part in the form of commissions, bonuses or overwritings; and,

"Whereas, the demand for the commodities and services we have to sell is more or less seasonal, resulting in periods which our income is far below that conceded to be the minimum necessary to maintain ourselves and families, despite the long hours and strenuous efforts demanded by our employers; and,

"Whereas, we realize the utter futility of attempting, as individuals, to correct the evils and abolish the

abuses existing in the specialty selling field; be it hereby,

"Resolved, that we weld our collective strength into one powerful national organization that will protect and further our interests as workers at all times; and

"Be it further resolved, that we strive to establish the right of our chosen spokesmen to negotiate in our behalf with the spokesmen of the employers;

"Strive to arrive at a more equitable basis of remuneration for the year round services of those who have made commission selling their life's work;

"Strive to discourage the ruthless exploitation of thousands of salesmen for a few months each year, without fair and commensurate pay for services rendered;

"Strive to eliminate practices on the part of employers tending to unfairly reduce the earnings of the salesmen;

"Strive to establish and maintain code of ethics, not only among salesmen but also between the employers and the salesmen to their mutual advantage to the creation of better public acceptance;

"Strive to arrive at and maintain amicable relations with all employers, their dealers and distributors, to the end that the salesmen, the employers, as well as the ultimate buyers be the gainers thereby.

"We hereby declare our determination to strive for the acceptance of our program in order that the salesmen of America may retain their self respect as men and women, and be assured of a greater measure of economic security as workers who in no small measure contribute to the wealth of the nation."

Dealers Make Closed Territory Agreement

SCHENECTADY, N. Y.—Members of the General Electric Specialty Dealers Organization (comprised of dealers in the distributorship of A. Wayne Merriam, Inc.) have formulated a definite policy with respect to operating under a "closed territory" policy.

Under the plan accepted by the organization's committee on relations, each G-E dealer will sell, install, and service G-E major appliances in a given territory described on his franchise. The dealer agrees not to solicit business outside of this prescribed territory.

However, should a prospect residing out of the dealer's territory come to the dealer's store to purchase a major appliance the dealer shall take the order, the down payment, and forward same to the distributor's general office in Schenectady; which will in turn forward it to the dealer in whose territory the prospect resides.

Under this plan the dealer taking the order is entitled to 10 per cent of the f.o.b. price.

Another resolution adopted by the committee was that inasmuch as the G-E dealer, having received the guarantee of the distributor that his territory would be exclusive, should confine his sales activities to the G-E line.

Crosleys in Boulder City Make Good Record

BOULDER CITY, Nev.—A check on the 28 Crosley electric refrigerators installed in as many apartments here by the Babcock & Wilcox Co. eight months ago shows that the units—operating in temperatures ranging from 100° to 120° F.—run less than 80 per cent of the time.

Westinghouse 'Handy Tray'



This feature of the new Westinghouse "C" line is designed to make food arrangement an easier task for the housewife. The tray can also be removed and used for serving. It folds up when the door is to be closed.

Convenience Features Mark Westinghouse New 'C' Series

(Concluded from Page 1, Column 5)
 touch of the finger, and can be lifted from its supporting rack to convey drinks, desserts, or other foods from the refrigerator to the dining room. It also comes in handy for the housewife when she is rearranging foods in the refrigerator.

Another new feature included in the "C" line is a refrigerated shelf in the evaporator, for faster freezing of desserts and ice cubes. This feature is found in the CL-63, the CL-65, the CP-65, the CL-75, the CP-75, the CL-95, and CP-95.

A "Sanalloy" metal evaporator replaces the porcelain cooling unit used on previous lines. Higher efficiency, elimination of chipping, and ease of cleaning are advantages claimed for the new evaporator by Westinghouse engineers.

A combination "Handy Jack" ice tray release and bottle opener is standard on all the new models.

The "C" line has been equipped with new hardware in a pleasing design. The "Handy Latch" door opener combines "finger action" with "knee action," in that it can be opened either with a touch of the finger or a touch of the knee in case the user approaches the refrigerator with both hands filled.

The name plate and control knob have been made larger, and modeled to match the rest of the hardware.

Retail prices on the new "C" models, by zones, are as follows:

Model No.	Zone 1	Zone 2	Zone 3
CL-43	\$134.50	\$136.00	\$138.00
CL-45	167.50	169.50	172.50
CP-45	192.50	194.50	197.50
CL-55	194.50	196.50	199.50
CP-55	219.50	221.50	224.50
CL-63	194.50	196.50	199.50
CL-65	219.50	222.50	226.50
CP-65	254.50	257.50	261.50
CL-75	239.50	243.50	249.50
CP-75	279.50	283.50	289.50
CL-95	279.50	283.50	289.50
CP-95	319.50	323.50	329.50

Grunow Promotion States Carrene Is 'Free' Feature

CHICAGO—The Grunow refrigerator Carrene is featured as an extra, "free" feature of Grunow household refrigerators in a new three-piece mailing campaign which is now being used by Grunow dealers.

First piece has as its theme "It's the most important thing—and it's free." Copy is typical of the Grunow Carrene advertising, and also brings in the features of the Grunow vacuum system.

Second piece is in the nature of teaser copy. "We dare to show you what's inside," it says, and invites the prospect to come and make the Carrene test.

"They said women couldn't understand—but 70,000 women proved them wrong," is the central theme of the third and final piece, copy for which centers on the vanity appeal—and the "getting something for nothing." The cabinet, metiflex trays, ice tray release, and diamond mesh shelves are also mentioned in this piece.

O'Keefe and Merritt Styles New Cabinets

(Concluded from Page 1, Column 5)
 tor, fully automatic temperature control, automatic defrost, rubber shelf supports, and broom-high legs.

All models are equipped with a twin-cylinder compressor powered by a 1/2-hp. motor.

The condensing unit carries a one-year guarantee. Sulphur dioxide is the refrigerant used in the O'Keefe & Merritt refrigerators.

The three streamlined models have 3 1/2 in. of insulation. The smallest model has 2 in. of insulation, and the other two models have 3 in. of insulation.

Key specifications on the O'Keefe & Merritt 1934 household electric refrigerator line are as follows:

Model No.	Net Cu. Ft. Capacity	No. of Ice Cubes	Price
344	4.17	56	\$119.00
345	5.17	56	149.00
346	6.22	84	169.00
634	6.22	84	189.00
734	7.42	112	224.50
1034	10.45	168	324.50

Leonard Ups Prices on Household Models

(Concluded from Page 1, Column 4)
 others have exterior finishes in lacquer.

Advances in the water cooler prices for zone 1 are as follows:

LDW-1, \$9.50; LDW-4, \$20.75; LDWC-4, \$18; LCW-1, \$9.50; LCW-4, \$15.25; LCW-8, \$17.25; LCWC-4, \$12.50; LCWC-8, \$15.50; LCW-612, \$1.75.

Models LDW-1, LDW-4, and LDWC-4 are bottle type water coolers; others are pressure type.

Continued increases in material prices are responsible for the price advances, Leonard officials declared.

BOTTLE COOLERS



FOUR MODELS

Ask for our New, REDUCED Prices and Catalog.

S. & S. PRODUCTS CO.
 P. O. Box N876,
 LIMA, OHIO

THE "EASIEST TO SELL" REFRIGERATOR EVER MADE!



JUST "STOP TO LOOK"...



THEN THEY TAKE OFF THEIR WRAPS...



AND STAY FOR A DEMONSTRATION...



SOLD!

CREATING A SENSATION EVERYWHERE—"SELLS ITSELF" RIGHT OFF YOUR FLOOR!

Public Welcomes New-Type Refrigerator...Setting New Sales Records Daily!

• We tell your customers—"Don't buy any refrigerator until you've seen the New-Type Stewart-Warner." And for exactly the same reasons we ask you to investigate the Stewart-Warner Line before deciding you're "set" for 1934!

Stewart-Warners are moving...breaking records, right and left! They're clicking with housewives, now, just as they did with experienced dealers and distributors!

Their selling features stand out in ANY company. They are literally turning demonstrations into sales at an unheard of rate! "Feather-Touch" self-opening doors...easy roll-out tray shelves..."forget-proof" defrosting and quick-chilling!

STEWART-WARNER
 New-Type HOME REFRIGERATOR

These are but a few of the dramatic features that are gripping the imaginations of housewives the country over!

But you've got to get the whole story before you can fully appreciate the opportunity for present and future sales that the Stewart-Warner franchise offers you. Mail the coupon today! No obligation!

SEND ME ALL THE FACTS QUICK!

STEWART-WARNER CORPORATION
 1841 Diversey Parkway, Chicago, Ill.

Send me complete information on your 1934 Refrigeration Line!

Name.....

Firm.....

Address.....

ERN-5-2

Joins Temprite



JOHN WYLLIE

Wyllie Named Sales Chief of Temprite

(Concluded from Page 1, Column 5)

the industry was in 1924, when he was employed in the plant of Nizer Corp. He had previously been employed by Dodge Bros. and Burroughs Adding Machine Co.

Shortly after he joined Nizer he was transferred from the plant to the factory service department, and later did field service work on Nizer equipment.

Organized Correspondence School

In 1926 Mr. Wyllie organized the Nizer Service Correspondence School, which was open to anyone interested in learning more about electric refrigeration. At one time 6,000 students, from all parts of the world, were enrolled in this school. Mr. Wyllie wrote all the text material for this school, and several of his "lessons" were printed in early issues of ELECTRIC REFRIGERATION NEWS.

A. W. Berresford, now managing director of the National Electrical Manufacturers Association but at that time vice president of Nizer Corp. in charge of engineering, named Mr. Wyllie as his assistant. In 1928 Mr. Wyllie became special representative to C. K. Woodbridge, president of Kelvinator Corp., with which Nizer was merged. Shortly thereafter he was appointed assistant manager of the Kelvinator factory commercial sales department.

To New York in '29

In 1929 he was sent to New York City to take over the direction of commercial sales for the New York branch. In 1930 he returned to Detroit to organize and manage the Kelvinator commercial engineering department.

Last year he organized the sales engineering department of Kelvinator Corp., and was manager of the department at the time he left to take the new position with Liquid Cooler.

Mr. Wyllie is a director of the American Society of Refrigerating Engineers and is a graduate of the University of Michigan.

Kelvinator to Sponsor 'Mystery Cruise'

DETROIT—A steamer whose captain is honor-bound not to open his sailing orders until his ship has weighed anchor, whose hundreds of passengers will not know their destination until the vessel comes to rest in some far-away harbor...

This is not the beginning of a mystery story, but merely some of the details of Kelvinator Corp.'s 1934 "Mystery Cruise," reward extraordinary for salesmen who make outstanding records in the sale of deluxe models during the current refrigeration season.

During the 90-day period from April 15 to the middle of July, Kelvinator salesmen are concentrating their efforts on the Kelvinator deluxe line.

For each 1,000 cu. ft. of deluxe Kelvinator models purchased between Oct. 1, 1933, and June 30, 1934, Kelvinator distributors will be allowed to send one sales representative on the week-long "Mystery Cruise."

Separate contests will enable the outstanding distributors' and wholesale men to win passages also, and a wide variety of minor awards will be open to those who fall short of national honors.

Winners will be announced late in July, and the cruise will begin early in August.

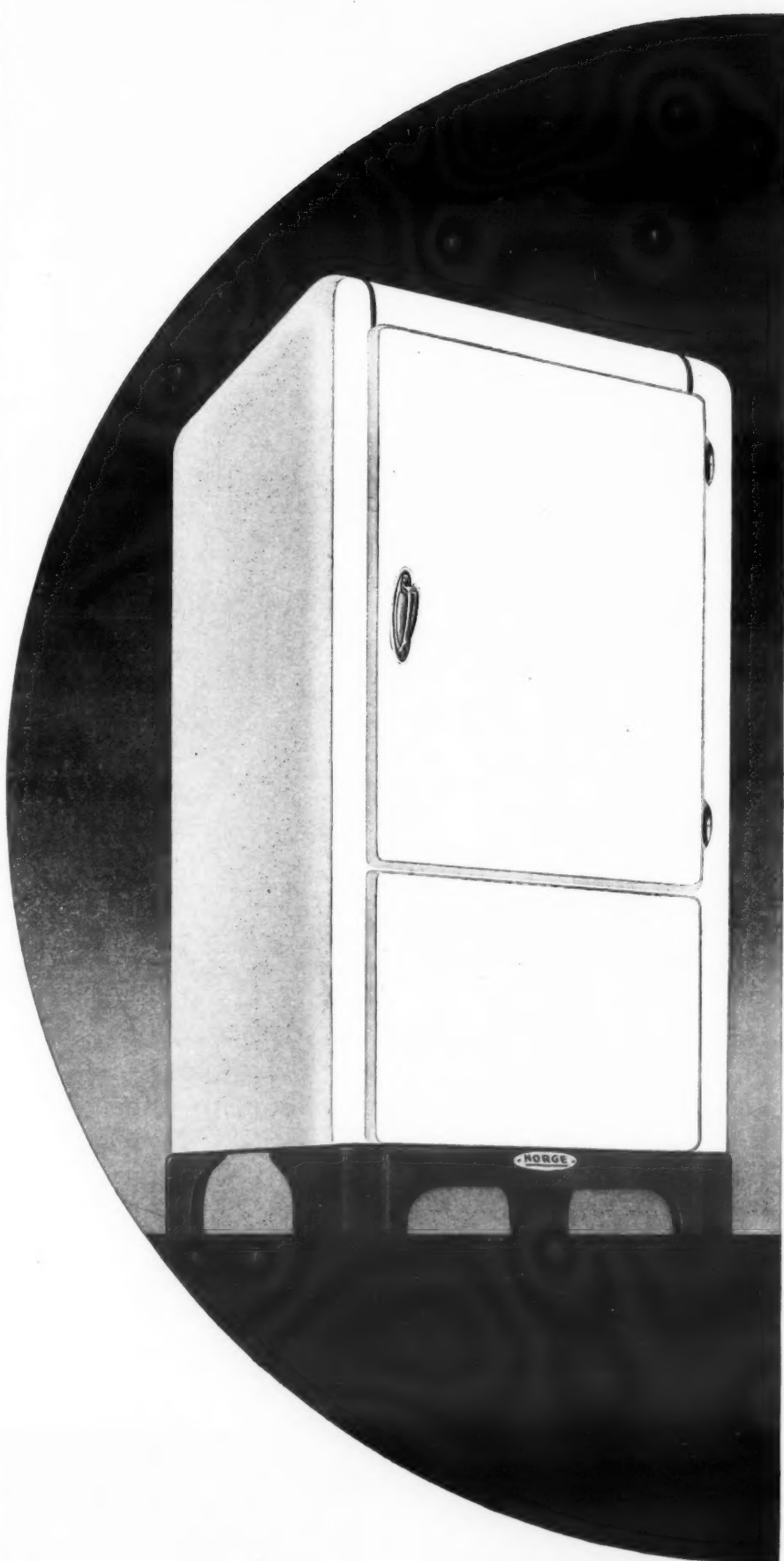
Norge Publishes Recipes Of Movie Stars

DETROIT—Norge Corp. has just issued a recipe booklet containing 100 favorite "cold cookery" recipes of leading movie stars.

Rollator Refrigeration

FORGES AHEAD TO NEW RECORDS WITH

A NEW AND FINER NORGE



NORGE
Rollator refrigeration

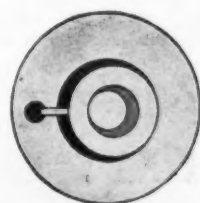
Customer appeal as never before... radiant beauty... new importance... new conveniences... the new Norge has everything. And in addition... it has the Rollator, the marvelously efficient, simple and durable Refrigerating mechanism... a value that every customer can see and understand. Once the Norge is known it is *sold*.

• Enlist this sales-compelling force in your own behalf. Remember, Norge never stands still. You'll catch the Norge spirit. You'll get Norge sales support... advertising... merchandising helps. There's determination, ambition, a matchless product—a great Norge drive. There's a flood tide of Norge buying on the way. It's going to be easier than ever to sell the refrigerator that bears more original and exclusive features... and in addition... Rollator Refrigeration.

• It's a question of *action*... the first step always to better business. Write, wire or phone *Today* for details. Investigate Norge before you take on any line.

NORGE CORPORATION
Division of Borg-Warner Corp., 606-670
E. Woodbridge Street, Detroit, Michigan
Manufacturers of Rollator Refrigeration • Electric Washers • Broilator Stoves • Aerolator Air Conditioners • Norge Oil Burner

THE ROLLATOR • Smooth, easy rolling power instead of the hurried back-and-forth action of the ordinary refrigerator mechanism. Result—more cooling power for the current used, and a mechanism that actually improves with use. Only Norge has the Rollator.



NEW YORK DEALER NEWS

(Continued from Page 1, Column 5)

by the same people who own Rochester Branch Sales and hired Mr. Smith as appliance manager. So Mr. Smith has placed Kelvinator displays in these stores, keeps salesmen there to contact housewives who are at the peak of "food-mindedness."

One of these stores is in the heart of the downtown section, and in it are two Kelvinator displays. Another is on West Main St., where shopping traffic is also heavy; it has one display. Third store is on Lewiston Ave., in the heart of the Eastman Kodak community — has one display, also. Fourth is at Brown and West Aves., where neighborhood shopping is done.

On the floor above the East Ave. food store is the Wegman Food Institute, in which the Kelvinator dealership sponsors four cooking schools each week, and holds card parties for women's organizations.

At both the schools and parties, which draw an average of 700 persons weekly, a talk is given on refrigeration in general, Kelvinator in particular. Wegman bulletins, advertising food bargains, carry announcements of the schools each week.

At all of these six outlets, Kelvinators are sold on the meter plan—no down payment, and as low as 15 cents a day on some models. The dealership depends almost entirely on floor traffic, salesmen spending most of their time in one of the stores, and earning commissions of from six to eight per cent.

Said Mr. Smith, "We can afford to do practically all our business on the meter plan, because the president of this company can easily endorse \$150,000 worth of paper. Small dealers couldn't even approach that figure without exhausting their credit completely."

Thirty-five per cent of the people

wishing to buy a Kelvinator from Rochester Branch Sales on the meter plan are turned down, said Mr. Smith, because of unsatisfactory credit ratings. "That's how we take precautions against repossessions," he added.

Average meter payment is 30 cents a day, with 24 months to pay, Mr. Smith told us. That is for a 6-cu. ft. lacquer Kelvinator. Sixty cents a day is about as high as meter plans go in this company. The manager anticipates sale of 750 units this year, and believes that about 550 of them will be sold on the meter plan.

Low Prices Get Play From Department Stores

The E. W. Edwards department store in Rochester is also using meters in its sale of Frigidaires, and the McCurdy store there sells G-E on the meter plan.

While most of the men we talked to in that city do maintain that Rochester is a hard nut to crack as far as merchandising of refrigeration is concerned, there was plenty of evidence that retailers there aren't letting time pass without attempting to do something about it.

Low price was getting big play in local newspaper advertising. So was the 15-cents-a-day idea (not meter plan). And we heard that several outlets are putting refrigerators out on a 30-day free trial basis.

McCurdy's department store is advertising 7-cu. ft. G-E's for -169—last year's flat top models. H. D. MacRae, Inc., Gibson distributor, is offering 6.3-cu. ft. Gibson's for \$139.50—models built by Gibson last year for department stores—and a 6.5-cu. ft. '34 Gibson in porcelain for \$159. Sears Roebuck, we understood, is selling a 6-cu. ft. box for \$134.50.

Electrical League Starts Campaign

Recently, the electrical league in Rochester was reorganized somewhat, principally to widen the scope of its activities and include several branches of the electrical industry in Rochester not previously represented. The organization's name was changed to Electrical Association of Rochester.

Henceforth, its purpose shall be to tell the public in and around Rochester (1) why it should have certain electrical equipment, (2) what types and makes are on the market in that area, and (3) where they may be purchased.

On April 15, the association, in cooperation with local distributors and dealers, began an advertising campaign on electric refrigerators to run until the end of June. According to E. J. Kramer, secretary, the plan calls for use of 3,500 lines a week, in three newspapers.

All of the advertisements will outline the advantages of electric refrigeration, picture the various makes sold in Rochester, and list names and addresses of the 11 distributors and their dealers who comprise the refrigeration section of the association.

In the future, a similar type of advertising will be used in promotional campaigns on other appliances, commercial and domestic lighting, heat and power, radio, air conditioning and commercial refrigeration, and other new devices, Mr. Kramer stated.

Although the city has been slow to accept electric refrigeration, it is finally becoming conscious of it, Mr. Kramer said. He pointed out that last year's refrigeration sales were evidence of this, for 3,400 household models were installed by Rochester retailers. They hope for sales of 4,500 this year.

The Rochester Gas & Electric Corp., selling Frigidaire, G-E, and Electrolux, does an aggressive job of selling

under the direction of Frank Houston, and is particularly strong in its use of outside salesmen.

Outside 'Icers' Stop Many Sales—MacRae

H. D. MacRae, Inc., Gibson distributor in Rochester, is giving special attention this year to commercial sales. As in household refrigeration, the percentage of commercial saturation is quite low, and with the town's general business condition showing marked improvement, Mr. MacRae believes commercial sales will be much better than last year.

One reason why domestic electric refrigerators have been slow to sell in Rochester, said Mr. MacRae, is that an unusually large number of homes in the city have built-in ice boxes, with outside icers. "It is hard to convince owners of these homes that they should tear out something that is permanent equipment."

Many of the town's wealthier people are still without electric refrigeration, the distributor said. Most sales made by him and his dealers during the past few years have been to the middle class, not to people in the higher income brackets.

This distributor isn't going into the air-conditioning business for a while yet. "There's still too much missionary work to be done," he said.

Working in the Rochester territory to secure dealers for the Treman & King Co., Stewart-Warner distributor in Ithaca, is O. G. Grabbe. Retailers who last year handled refrigeration, and have taken on Stewart-Warner this year, expect to go 50 per cent ahead of last season in sales, Mr. Grabbe told us.

"Up to this year, Rochester has been in the promotional state, just getting sold on electric refrigeration," he stated. "It is refrigeration conscious for the first time, and I think it will result in good business for most of the retailers here."

Utica, N.Y.

After a day of visits with retailers in Utica, N. Y., we concluded that G. H. Day, sales promotion manager of the Utica Gas & Electric Co. had put it pretty well when he said that the refrigeration business moves along without much hubbub, with a satisfactory volume of sales, and a minimum of trouble.

Retailers admitted to us that there is some chiseling being done, but it hasn't assumed the proportions of a major ill, apparently, for the remarks we heard about it weren't nearly so bitter as in some other cities. Several agreed that price-cutting isn't as prevalent in Utica this year as last.

There are between 5,000 and 5,500 domestic refrigerators installed in the city's 26,000 wired homes. From Jan. 1 to April 1, 203 new units went on the lines. General business there is on the incline, principally because of stepped-up activity in the textile mills.

The utility stopped appliance merchandising in 1932, but has since cooperated with local dealers on sales promotion. Shortly after the company abandoned merchandising, some of the town's retailers organized Appliance Dealers, Inc., an association which serves primarily as a forum in which members promote ethical merchandising by informal discussions of current sales practices.

5,000 Visit Show During First Week

A refrigerator show sponsored by dealers, in cooperation with the power company, was in progress when we were there April 24. Held in the main showroom of the utility, it comprised 10 makes. Five thousand persons attended it during its first week, starting April 16, and it was scheduled to run until April 30.

Comparatively little build-up was given the affair, except for six full-page newspaper advertisements paid for by participating dealers.

Refrigerators and dealers repre-

sented at the show were as follows: General Electric—A. Wayne Merriam, Inc. (branch); Coldspot—Sears Roebuck & Co.; Norge—Lockner's, Inc. and E. B. Worden & Co.; Gibson—Hesse-Schnitt, Sonne Bros.; Kelvinator—Harris Bros. & Co.; H. D. Morehouse & Son; Potter-Schwender's, Inc.

Crosley—Miller Electric Co., J. B. Wells & Son Co., Dan Milne Home Craft Service, Williams Radio Shop, John Hooks, Utica Radio Supply Co.; Frigidaire — Burton's Stove Store, Goodman's Home Furnishers; Grunow—Harris Bros. & Co., Marson's Furniture Store, Roberts Hardware Co., Livermore & Story, Inc.; Westinghouse—Kempf Bros.

Club Plan Sales Boost Kempf's Store Traffic

Head of the retailers' association is Leo M. Rayhill, manager of Kempf Bros., which organization serves as the sole Westinghouse retail outlet in Utica and is distributor for a number of dealerships in towns on two sides of the city.

In its retail operation, this firm specializes on "club plan" sales of appliances. Each month, it advertises a special plan by which appliances may be purchased. If a prospect buys according to a certain plan, he becomes a member of that month's club.

For instance, the store might make its February club one in which a prospect could buy a refrigerator without having to make a down payment. In March, its club might be open to prospects wishing to avail themselves of a special payment plan on merchandise for future delivery.

Because of these promotions, store traffic is the chief source of the firm's buyers. Its nine outside men spend practically their entire time following up prospects who have come to the store to inquire about a certain club.

Eighty per cent of the company's total retail sales are made in the store. So far this year, about 12 per cent of its sales have been for cash, that percentage being higher than last year. The firm's club plans are directed at the instalment-buying market. Kempf handles all its own paper.

Sales this season are about 30 per cent better than last year, and Mr. Rayhill expects the year's total business to surpass last year's by about that percentage. Majority of buyers, he said, are factory workers who have benefitted from recently increased wages.

"Business would show greater improvement," he observed, "if this town could see a year ahead. As it is, the mills work overtime for a few weeks, then lapse into inactivity, then boom again for a while. No one knows just how much he can depend on them."

Kempf salesmen make a big talking point of Westinghouse refrigerators' conservative styling. They are instructed to say that with Westinghouse, a user is in no danger of having her refrigerator outmoded by a next year's model. "It's just like Packard motor cars," they tell prospects.

Mr. Rayhill can't say enough fine things about the Westinghouse Electric Supply Co. branch in Utica, which serves dealers in territories adjacent to those of the Kempf company. Said the manager: "They send us leads, we send them leads. We have never had cause for complaint against them. Westinghouse factory should make a campaign to promote Wesco-distributor cooperation such as we have here."

Speaking about the dealer association which he heads, Mr. Rayhill said, "Best thing about it is that it has made us know each other, and that's half the battle. A dealer often thinks his competitors have horns and are bums as far as ethics are concerned. Then he gets to know them, and finds out they're really as anxious for clean business as he is."

"In our meetings, we Utica dealers have found one thing to be definitely true: that the customers, not the retailers, are at the bottom of a lot of price-cutting. A prospect goes peddling tales from store to store about the price he can get somewhere

(Concluded on Page 5, Column 1)



It's just a *if* FROZEN ASSET the customer can't buy it

All the money you have tied up in electric refrigerators is frozen as solid as a 1928 mortgage if you can't offer your customers terms they can meet.

Very few people can pay cash on the line. Most of them need time—twelve months—eighteen months—maybe even longer.

Commercial Credit Service, fair as to service charges, square as to reputation, will help you make sales. It's a service that is nationally known, used, and respected. It includes investigation in advance to minimize your risk—regular collection—and prompt remittance. It is available through 125 offices in the principal cities. Write today for full information.

● Commercial Credit Company purchases open accounts receivable, notes, and instalment lien obligations from responsible Manufacturers, Distributors and Dealers. Financing plans are provided to cover the time payment sale of automobiles, refrigerators, oil burners, machinery and equipment, air conditioning units, heating plants, store and office fixtures, boats, and a score of other such broad classifications, including hundreds of individual products. The service is national in scope, yet completely local through 125 offices located in the principal cities of the United States and Canada.

COMMERCIAL CREDIT COMPANY

COMMERCIAL BANKERS

Headquarters BALTIMORE

CONSOLIDATED CAPITAL



AND SURPLUS \$39,000,000

Wherever You Are • Whatever You Make, Sell or Buy • Use Commercial Credit Service

YOU INVEST \$18.33
GROSS \$30.56
PROFIT \$12.23

... with GILMER'S fast-selling 35-R assortment of moulded rubber electric refrigeration belts. You are sure of fast turnover. It enables you to service 35 makes... including 140 models... of popular electric refrigeration units. All belts sleeved and marked for quick identification. 25 display books furnished... FREE... with each assortment. Write TODAY for catalog sheet containing complete details, including belts for all makes and models. The L. H. GILMER COMPANY, Tacony, Philadelphia, Penna.

Gilmer
 Makers of the World's Best-Known V-Belts

Specialists in Quality Belts Since 1903

DEALERS

(Concluded from Page 4, Column 5)
else, and before long all the dealers are slashing their prices and swearing at each other."

Schwender Outlaws Price Cuts & Trade-Ins

No price cuts, no trade-ins is the policy upon which Fred O. Schwender says he is going to operate his refrigerator business from now on. Until a few weeks ago, Mr. Schwender handled only G-E; now he has Potter, too, and plans to put most of his sales effort on the latter line.

This dealer is convinced that if retailers don't do their bit toward abolishing all price-cutting by stopping it in their own organizations, of their own accord, the time will come when they will be compelled to stop it by stringent action from the government or some similar agency.

"It isn't a matter of learning how to operate a business in a new way. It's a matter of letting go of the old methods," he asserted. "Selling organizations have been trying to substitute everything for work."

Mr. Schwender thinks that user satisfaction is one of the best advertisements a business can have, and has taken steps to get it. After making a sale of any electrical appliance, his salesmen are required to read to the buyer all instructions for operating it. Two weeks after the sale has been made, the salesman calls to check up on the appliance, and make necessary adjustments. Then he gets his commission.

All trade papers, manufacturers' literature, etc. coming to this dealership are perused carefully for information which might be of value to the sales force. From 8 to 8:30 o'clock each morning, the salesmen spend their time reviewing this material.

Burton Sponsors Commercial Show

Stoves, all kinds of them, are Item No. 1 in the two stores operated by George W. Burton in Utica. In 1933, the stores made 1,816 sales. Twelve hundred of them were for stoves, the rest being divided among refrigerators, washers, and radios. But this year, it appears that refrigeration may be the big seller.

There are three reasons why Mr. Burton expects to sell three times as many refrigerators as he sold last year: 1. He has improved his outside selling organization. 2. General business is better. 3. There is just one other dealer in town selling Frigidaire.

The dealer lamented the fact that there is some price-cutting going on in the city, and said, "It is chiefly the result of hard times, when merchandise was hard to move, and sellers and buyers alike got the habit of thinking any price could be lowered."

Commercial refrigeration is being promoted aggressively by the Burton organization this season. Recently, it sponsored a commercial equipment show in the local auditorium, invited food merchants, dairymen, farmers, restaurateurs, etc. to attend.

The Utica health officer addressed the group at the show, factory-prepared movies were shown.

In this store's service department is a card index of most of the Frigidaires installed in Utica and within a 25-mile radius of the city. It was kept, formerly, by the Frigidaire factory branch there which was discontinued last year.

"It is a big sales help," said Mr. Burton. "We can tell prospects exactly how much service their friends' Frigidaires have required."

Merriam's Refrigerator & Washer Sales Good

Business in both washers and refrigerators has been much better this year than it was last for the Utica branch of A. Wayne Merriam, Inc., G-E distributor, according to S. S. Mowers of that company.

Shop foremen, office workers, railroad employees—those earning \$1,800 a year or less—have been the principal buyers this season, he said.

Prospect Wants a Light In Her Kelvinator

Starting out with Kelvinator this year in Utica is H. D. Morehouse & Son, a Copeland dealer last year. Stanley Morehouse, head of the refrigeration department, has put three men on household refrigeration, and plans to switch them to commercial (Carrier) selling in the winter.

While the News reporter was in Morehouse's store, a woman came in to look at Kelvinators. Mr. Morehouse gave her a demonstration of a 6-cu. ft. model, at the end of which she asked, "Doesn't it have an electric light?" The answer was "no."

"Is this a 1934 model?"
"Yes, but it isn't a deluxe model."
"Well, I want a light," she said, so he lead her to a higher-priced model.



"... and listen, you men... Dry-Zero insulation helps save as much as 60% in operating costs over some of your best known competitors."

DRY-ZERO
REG. U.S. PAT. OFF.
THE MOST EFFICIENT
COMMERCIAL INSULANT KNOWN

Dry-Zero offers one of the best selling points any salesman of a Dry-Zero insulated job can use. It is the chief reason why a low temperature can be maintained in the box with a minimum consumption of current. Dry-Zero assures economical operation for the life of the refrigerator. If you want the complete story of Dry-Zero insulation, write for "What is Dry-Zero."

Dry-Zero Corporation

CHICAGO
Merchandise Mart

TORONTO
687 Broadview Ave.

Refrigeration Dealers Must Learn Art of 'Buymanship'

Economy of Operation, Convenience Features & Mechanism Are Chief Buying Factors

By John H. Knapp

Vice President in Charge of Sales, Norge Corp., Detroit

DURING the past year, I have traveled nearly 100,000 miles in all important cities and in almost every state of the Union. I have met thousands of refrigerator dealers from the hamlets and the towns and the metropolitan centers of this country. The fact that stands out vividly in my recent travels is the amazing way business is improving. Happy days are here

again. 1934 will be the greatest year the refrigeration industry has ever known.

Over \$40,000,000 has been recently added to our national weekly payroll through increased employment and wage scales. For example, March payrolls at the Norge Muskegon plants were 400 per cent greater than for the corresponding month of 1933.

Gross farm incomes increased 12 hundred million dollars in 1933, a gain of over 24 per cent.

The outpouring of Federal funds amounts to \$387.50 per American family, a sum greater than the average savings, in that 70 per cent of the 50 million savings accounts in this country are \$379 or less.

The consumer is losing her fear complex. Over 80 per cent of the 40,000 women recently surveyed by a large department store in four cities definitely stated that they believed the country to be on its way out of the depression.

And consumers are starting to buy in a big way again. The Federal Reserve Board announced on April 13 that March department store sales throughout the country had increased 44 per cent, the largest gain reported for any month since depression swept the country in late 1929.

The electric refrigeration industry is set to win the lion's share from this amazing upswing. Staggered by losses in savings and shrinkages in security values, the public shows that it would *now rather own goods than money*. During the old "easy money" days, the focus of social interest fell largely outside while *now it centers itself within the home*.

Nothing contributes more to the pleasure, convenience, protection, and comfort of home life than does electric refrigeration. It is therefore the most wanted of all home appliances. Refrigeration holds the leading position in buying preference today.

The electric refrigerator is the only major appliance in the middle of its expansion cycle with years of low resistance selling still before it. It is the one appliance whose purchase largely finances itself from the savings it creates.

In the recent Norge consumer survey in 339 cities, which I will describe later, 32.2 per cent of non-owning families declared their intention to buy an electric refrigerator in 1934. There is an unsold expansion potential of 5,040,000 units.

This declared buying intent permits the reliable prediction that 1,622,880 units will be sold this year; a gain of 50 per cent over last year, the previous high record.

This prediction is already turning into fact. For example, on April 15, Norge 1934 orders were four times those of the corresponding period last year; representing, in fact, 78.6 per cent of total shipments for the entire year of 1933. Our unfilled orders on that date were 1,260 per cent greater than on the corresponding date last year.

We of the refrigeration industry are surrounded by the greatest sales opportunity we have ever had. Take care that you do not overlook it.

Although electric refrigeration has been fortunately depression-proof, other dealer lines have not. Don't judge it in their light. Faced with constant discouragements in attempting to merchandise their regular lines, many dealers have come to feel that there is little use in trying. Sales effort has slackened. Conditions have changed.

You dare no longer feel contented with the accomplishments you were forced to endure during the depression. Get away from habit of feeling defeated. Snap out of it.

Divorce refrigeration from the discouraged viewpoint built up by other lines. It is the one thing above all that you can go places with. Give it the gun this year.

Today's Public Must Be Sold

Times have changed. New conditions demand new selling methods. The good old ways are the new poor ways today. All of us must keep on our toes or we will find ourselves flat on our backs. A few years back, the public bought; now it must be sold.

A little while ago, manufacturers gave prime attention to manufacturing goods, now they must concern themselves with manufacturing customers. The consumer and dealer now control the destiny of every company. What you want and need is the important consideration.

We manufacturers must change our viewpoint. Rather than plan from the company outward as formerly, we must learn to plan from the consumer inward. The most vital point in the entire marketing gap is what occurs between the dealer, his salesman, and the public.

A manufacturer can be no stronger than his dealer organization and no dealer can be any better than the aggressive effectiveness of his salesmen.

And you dealers must change your viewpoint if you expect to capitalize fully upon this great refrigerator sales opportunity. You must quit acting as dealers and become merchants. The two terms are often considered the same when in reality they are almost total opposites.

A dealer is a relic of that glorious past when the seller had the advantage. The average retailer's attention was then given over largely to buying. Goods were referred to as being "handled" rather than "sold." The old style dealer was the kind of a duke who removed Christmas posters from his windows in May.

In the gradual evolution into our present buyer's market, dealer tactics have changed. He has brightened up his store, departmentalized his accounting, reduced the number of lines handled, made use of island displays.

More advanced dealers on the verge of becoming merchants have opened up the maximum amount of their stock so that it can be seen, handled, and inspected by store traffic.

Yet he still remains somewhat a dealer. More interested in buying than in selling. Content to sit at his desk in the back of the store rather than to be up front with a sales-winning smile.

Merchant Interested In Selling

The merchant, on the other hand, is more interested in selling than in buying. He makes utmost use of proper store promotion. He uses appealing direct mail, advertising, and promotion to draw a greater traffic flow into his store than would otherwise come.

Then, he takes the further step and makes his sales dollar turn over outside his store. A merchant is always a good dealer, but the dealer is far from being a good merchant.

In the competitive struggle of this past depression period you will either have to be a good merchant or you will probably go out of business. This is particularly important in the home appliance field where you are handling products "which have to be sold" rather than those which are "voluntarily bought."

Business will pass by your store, if as a dealer, you wait for it to come. You can gain spectacular sales increases, if as a merchant, you organize yourself to go out into the neighborhood and sell.

Everything depends upon you. If you fail, everyone loses. Families in your neighborhood go without home comforts, pleasure, and convenience they might otherwise have. Your salesman goes without unearned commissions. You suffer lost profit from ungained sales.

Beyond you, distributor salesman, distributor, factory field organization, and the manufacturer you represent are forced to put up with less business than they might have had if you had not elected to remain a lazy dealer rather than to turn yourself into an aggressive merchant.

Because this matter is so important to all concerned, I want to attempt to describe what it takes to be a good electric refrigerator merchant.

A good refrigeration merchant must understand, appreciate, and appeal to the buyer's viewpoint. The housewife runs your business. Get on her side of the fence.

You cannot sell her anything, but you can create her desire to buy. Appeal to her particular motives and interests. Become skilled in "buymanship" rather than "salesmanship."

1934 Buyers Will Look At Two Makes

We conducted the most comprehensive consumer survey of the electric refrigeration industry which has ever been made in the late fall of last year to find the angles of greatest consumer appeal. This study was made by personal interview with 23,322 families in 339 cities of 47 states. Twelve thousand seven hundred

eighteen of these families did not own electric refrigeration.

Any survey above the limits of 10,000 consumers strikes a dependable average from which general deductions can be safely made. This survey has been widely quoted in many of the business magazines. I will be glad to make reprints of these articles available to you. At this time I want to touch upon a few facts which you can put to use to your sales advantage.

One of the most valuable conclusions from this study was that the average 1934 refrigerator buyer will look at but two makes before reaching a final decision. Similar surveys in other industries disclose that the average buyer looks at 3.1 automobiles, 2.9 radios, 2.6 washing machines.

The range of shopping comparison for electric refrigerators is less than for other products. The refrigeration merchant has greater need for more intensive direct selling.

Plan some daily system to permit your salesmen to see the maximum number of prospects in their homes and present them with the most powerful story of the use values of the refrigerator you handle.

God help you if the line you handle does not possess some vital distinction of a demonstrable nature. The public is "buying the difference" today. It is seeking exclusive advantages and plus values as never before.

Another interesting conclusion of this survey was that the big four leaders (Frigidaire, General Electric, Kelvinator, and Norge) represent 63.6 per cent of present ownership and 72.4 per cent of probable ownership.

Public preference is centering among the leaders. The inevitable eliminating process is going on. Chiselers and little known companies are being frozen out. A good refrigerator merchant will be careful to avoid building up neighborhood goodwill for any of the "also-rans" who may be eliminated.

Perhaps the most important finding of this survey is the relative importance of various buying appeals. It gives you a presentation pattern by which you can tie your arguments close to the buyer's interest.

Economy of Operation Leads Buying Factors

When asked this question: "What factors will most influence your 1934 buying decision?" 12,718 non-owners ranked them as follows:

Economy of operation was first. It emphasizes the importance of savings.

Convenience features ranked second, which indicates the wisdom of stressing use values more than heretofore.

The third factor was *mechanism*, which indicates that women are more interested in the mechanical eminence of the product you are selling than has been presumed.

Fourth was *beauty*, which indicates the importance of selling a refrigerator whose design has none of the old ice-box appearance about it. The kitchen is the most used room in the home and the refrigerator is the most shown appliance. The prospect wants classic charm, capable of arousing great pride of possession; beauty that will be modern throughout a lifetime of service.

Fifth was *company stability*, which emphasizes the wisdom of representing one of the leaders of the industry. Sixth was *dealer responsibility*, which indicates that you are an important factor in influencing the purchase.

These six dominating factors have a total importance of 87.8 per cent. By confining your selling argument to them you can have absolute confidence you are touching the buying interest of nine of each ten prospects.

It is interesting to know how relatively insignificant the buying appeal of price was shown to be as a factor. It had an importance rating of only 5 per cent. This demonstrates that the average prospect gives relatively little attention to price itself.

The era of "price bargaining" has passed. The public is now interested in "value bargains." The good refrigerator merchant in 1934 will sell away from price and toward the values and savings which make electric refrigeration such a remarkable investment.

Another interesting deduction is that 12,718 non-owners mentioned only 15,499 buying reasons, or an average of 1.1 per prospect. This is a much lower ratio than for other products. It indicates that your salesmen need find only the one most interesting buying factor of the leading five.

When this is uncovered in the approach and concentrated upon, your salesmen can expect to close more sales faster and more frequently than they have heretofore.

45% of Sales Made in Store & 45% Outside

If you are to be a good merchant this year you will learn to draw nearer to the buyer's interest. Appeal to these influencing factors. Handle a line of refrigerators that has demonstrable plus values. Avoid the hazard of building goodwill for a line that may disappear. Plan to see the (Concluded on Page 7, Column 1)

A Common Cause of Paint Failure and its Scientific Prevention

Men Who Sell Enameled or Lacquered Iron or Steel Products Should Read This Interesting Bulletin . . .

Science is inquisitive. It is continually prying into the whys and wherefores of natural events. Since it has become a complement of business, it has made progress possible that compares with the rapid development of a naturally inquisitive child.

In prying into the cause of the very common phenomena of rust forming on steel surfaces, valuable facts have been uncovered.

Men have seen considerable sections of paint, enamel or lacquer lift from the surface of steel, surrounding a slight abrasion, for no apparent reason, leaving the metal bright and clean until corrosion appears, which develops rapidly on such exposed surface.

This bulletin deals with this common condition—a condition that shortens the life of practically all paint coatings on steel unless proper precautions are taken.

Write for your copy of this bulletin. You'll find it of utmost interest and value.

PARKER RUST-PROOF COMPANY
2197 EAST MILWAUKEE AVENUE, DETROIT, MICH.

PARKER
RUST-PROOFING
processes

WRITE FOR YOUR COPY
OF THIS BULLETIN

PARKERIZING • BONDERRIZING

FIGURE 1

FIGURE 1—Untreated steel panel carrying two coats of baked enamel, pricked, and subjected to 228 hours in the salt spray. Light areas show where alkali destroyed paint film surrounding rusted abrasion.

FIGURE 2—Bonderrized steel panel with two coats of baked enamel, pricked and subjected to 228 hours in the salt spray. Slight rust occurs where metal was exposed, but no spreading of corrosion or alkali to surrounding area.

John Knapp Says:

(Concluded from Page 6, Column 5)

greatest number of people in your neighborhood. Sell them most effectively.

Just as there is a golden proportion in art so I believe there is a golden proportion between the sources of a good refrigerator merchant's volume flow. The closer he comes to this, the better merchant he is.

After observing the practice of thousands of dealers in all sections of the country, I have come to feel that this golden proportion is 45 per cent of volume from store selling, 10 per cent from direct mail or other sources which attract more store traffic than would otherwise come in and 45 per cent from selling outside the store.

Store sales are obviously the most profitable. The product can best be displayed and demonstrated there. The prospect can be convinced with less effort.

Resort to all modern merchandising tactics to make your store more appealing, to make your "goods talk" more persuasively and to train your clerks to sell more efficiently inside the store.

But if you are a good refrigerator merchant, you will know that as long as you stop there you may lose customers to someone else before they come into your store. Resort to magnetic direct promotion and advertising in its many varieties to persuade those who would not otherwise come in that you have some special value worthy of their visit to your store.

Outside Selling Of Great Importance

When you have programmed the maximum in direct promotion of this type, you must still realize that for everyone who enters your store there are at least five neighborhood prospects whom you will never reach unless you extend your selling efforts outside.

Outside selling is now more necessary in electric refrigeration than ever before. I was particularly pleased to notice the recent statement of Emile Bacharach of Kresges' Department Store at Newark. It emphasizes the importance of outside selling.

Mr. Bacharach said, "The department store that doesn't engage in specialty selling and all that that term involves, including outside selling, might just as well forget about refrigerator business this year. It is our experience that 80 per cent of our total refrigerator sales are closed in the home and it is my belief that 70 per cent of these would be lost to us if we had no outside selling."

Naturally, as the industry gets deeper into its expansion cycle, selling resistances increase and remaining prospects become less apt to come into your store of their own accord. Outside selling must be used to compensate for this condition.

There are millions of women in the country who desire to buy an electric refrigerator but replacement needs for other things resulting from the depression together with their deflated family purses makes such purchases seem impossible. They have not been educated to the fact that the purchase of an electric refrigerator largely finances itself.

Being afraid that they might weaken if they come into a store to inspect one, their very desire for it keeps them away. The only way these can be reached and convinced that purchase is possible without draining the family purse is through more outside selling.

Beat Summer Slump By Canvassing

From another angle, outside selling is important in helping to solve the traditional sales slump of the industry. There have been many excuses advanced as to why this slump maintains but there is no good reason for it.

We know that refrigeration is appreciated and used by owners every day of the year. It provides protective values during winter months which are even more important than at other times during the year.

Many have presumed this condition to be an outgrowth of the old ice-box days. The industry permits it to continue when it might be changed. I have records of many Norge dealers who have successfully challenged it.

The most unreasonable part of the seasonal curve is the way sales fall off during the very months when a refrigerator is most used. Outside selling can solve this.

The industry has until now depended largely upon store selling. Its chief volume has naturally been gained in spring months when the public, after a long winter of hibernation, is interested in getting out to shop.

As sultry summer days come, the heat of business streets is something to be avoided. The average woman stays at home in the cool of her front porch. This does not mean that she is less interested in electric refrigeration—in fact, the annoying discomfort of hot weather makes her appreciate it more.

The trouble is she is not where the

merchant can reach her when he depends chiefly upon store selling. He can reach her during this season more surely and effectively in her home because she does not care particularly to work and will be more sympathetic towards a salesman's call.

Outside selling is the ultimate solution for the inexcusable summer slump, traditional to the industry.

Salesmen Must Be Equipped with Tools

There are many things to consider in organizing effective outside selling effort. You must handle a line which has distinctions which can be demonstrated in the home. You must enlist sufficient man power to cover your neighborhood. You must train your salesmen in outside selling methods, supplying them with selling tools for an effective home presentation.

Selling tools are as indispensable to the outside salesman as a wrench is to plumber or as a rifle is to a soldier. If you intend to be a good merchant in this fortunate year, you will see that your salesmen are properly tooled, and you will see that they are used.

Advertising, consumer literature, window display materials, and sales manuals are indispensable elements of a successful sales attack but they are not selling tools. What then is a selling tool?

It is any device that will have complete utility for the salesmen in front of the prospect during any state of the sales approach, presentation, demonstration, or close. Selling tools should be unnoticeable prior to approach, should arouse favorable prospect attention, and should provide easily found reference on any selling point.

The Norge Corp. has answered this vital need by supplying its 11,500 retail salesmen with a ready reference pocket kit, enclosed in a compact, leatherette case, chosen for its wearing quality. It fits the pocket neatly, has space for some 40 reference cards, and contains a side compartment for a pencil. It also has a collapsible pocket in which the salesman may conveniently carry personal papers.

The kit contains cards on product specifications and features, on consumer buying appeals, and on salient facts of the Norge sales training course to which the salesman may want to refer before he makes his approach.

Armed with this concealed and easily carried case, a salesman gains profound confidence in every approach because he knows that he will be able to handle successfully anything that may come up.

The only other selling tool used by Norge salesmen is a cutaway model of the Rollator, our cold-making mechanism. This is provided with a handle by means of which it can be easily carried.

Since the cutaway Rollator looks different from anything the prospect has seen, it arouses curiosity and is a cracker-jack as a door opener or to lead into the sales presentation. This model has a crank which, when turned by the prospect shows the slow, rolling movement of its three simple parts.

Nature provided the poor lightning bug with a tail light to light up the path along which it came but it travels in the dark so far as a way to go.

Many salesmen are human lightning bugs. They know only where they came from but not where they are going. They make the same old mistakes. They work without thinking. They have no sense of direction. They get nowhere.

One of the most common causes for sales failures is that the salesman does not understand the selling process. Just as a train must follow a track so a salesman must follow certain rules if he expects to get anywhere.

Set up some plan to train your salesmen in the art of selling. Make sure each salesman has a good approach technique to gain attention, a pattern presentation to create prospect interest, that he knows how to sell the plus values of the particular product in a way to arouse desire, that he is provided with convincing proof of these advantages and that he knows how to persuade prospects to buy.

A correct selling process is of great importance because otherwise your salesmen may fail to sell in a way that will result in owner satisfaction. A sale does not end at the dotted line. Rather each of us should sell ultimate satisfaction.

With such a selling process, a salesman usually attempts to dominate prospects by high-pressure methods. When a customer is sold this way, she often wakes up to realize that she has been mesmerized into a premature decision which in her later cool judgment she regrets.

Such sales result in trouble and dissatisfaction. The customer attempts to cancel the contract. Or she knocks the product to acquaintances. Or she demands excessive service.

But when you provide your salesmen with a correct selling process, he employs a calm, dignified, confidence-inspiring type of selling that

results in a greater ratio of prospects to calls and sales to prospects.

There are two particular points which should be stressed this year. The first of these is the importance of proof selling.

The drift of income has been downward in the past few years. Four of each five families have incomes of \$2,000 or less. There is 16 times the chance that your 1934 refrigeration prospect will be in the \$2,000 income class and less than in a higher one.

Such prospects have no money to waste. You must prove to each that your refrigerator is worth much more than the money paid for it. There was never a year when specific proof and sales justification were as important.

Now there are six kinds of sales proof which your salesmen should use.

First, *proof by specific statement*. General assertions always arouse doubt. Teach your salesmen to talk of specific people, mention specific figures, refer to specific tests in their solicitations.

Second, there is *proof by test* with which you should back up all major claims of product superiority.

Third, there is *proof by demonstration*. The feminine mind receives impressions 28 times faster through the eye than through the ear. You can prove your statements much faster by appealing to her sight, feeling, hearing, tasting, and smelling faculties than you will ever be able to do by logical argument.

Fourth, there is *proof by testimony* and the more profound and authoritative it is, as well as the more intimately connected with the prospect's attention, the more powerful it will be. Get letters from satisfied users for your salesmen. Prepare a local owners' list which your salesmen can pull out in front of the prospect.

Fifth, there is *proof by reference*. Teach your salesmen to refer to some neighborhood mechanic, some recognized expert, some leading salesman, or some important local profes-

sor whose influence will carry great weight with the prospect.

Finally, there is *proof by trial*. In a recent Daytona Beach case, a Norge dealer placed 37 refrigerators out on a week's trial and only one housewife failed to buy. She later bought. If you are in position to use this form of selling, it is the most convincing of all.

The last of the points I have to mention is the importance of training your salesmen to justify the purchase economically. The average family has about four times the usual number of buying desires and only about half the money to buy this year. The competitive battle by all manner of products for the consumer dollar is terrific. Purchase of an automobile may destroy interest in buying a refrigerator unless you train your salesmen to guard against it.

Refrigerator's Savings Must Be Emphasized

The electric refrigerator is in a fortunate position among home appliances in that it is the one of all whose purchase can be most easily justified on the basis of the savings it creates.

You justify the purchase of a radio on the basis of pleasure. You justify an automobile on the basis of convenience. You would have a hard time proving that they finance themselves from any savings they create.

In the case of an electric refrigerator, however, you can demonstrate to the satisfaction of any intelligent prospect that the purchase will not constitute a drain on the family purse. It will not interfere with the desire to buy other things. It actually finances itself because of savings in operating cost, food spoilage, utilization of left-overs and quantity marketing.

Although the electric refrigeration industry can escape this terrific inter-competitive struggle for the consumer dollar, the public is not generally edu-

cated to the specific savings which electric refrigeration makes possible.

It may, therefore, have the mistaken idea that its purchase involves a drain on the family purse. It is necessary for your salesmen to get this point over. When they do you can expect that a great sales increase will result.

You never faced a year of such great sales opportunity as this. But you will have to turn yourselves into better merchants to make the most of it. Get a balanced volume flow from store selling and outside activity.

Make sure that you are reaching every prospect in your neighborhood trading area with the most effective presentation. Enlist sufficient manpower to conduct an effective outside selling activity. Tool them and train them in a way to perform successfully under 1934 conditions.

If you do all this, providing you are handling the right product, you will end up the year with greater sales profits than you have heretofore enjoyed. You hold the destiny of the electric refrigeration industry in your hands. No manufacturer can climb higher or be better than your performance makes possible.

The Indians of the Northwest, when drying their winter supply of food, invariably hang their fish from trees at a height of 33 feet from the ground. Flies do not rise of themselves more than 32 feet above the ground and the Indians, knowing this, hang their fish just one foot above the "fly line."

It would seem a natural possibility for flies, once they get within a foot of all that food, to put forth just a little more effort and make the grade but flies either lack the sense or the power to do this.

Get above the "fly line." Be dissatisfied with every record you have heretofore made. Be willing to use unusual energy to climb the extra distance necessary to get the great reward which unusual aggressiveness will pay you this year.

How do YOU meet a Sales Situation like THIS?



WHEN DEPARTMENT STORES PICK OFF THE PROSPECTS WHO WERE "EDUCATED" BY YOUR SALESMEN

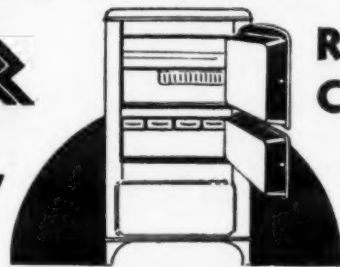
WHAT CAN YOU DO?

POTTER OUTLETS HAVE THE Answer! If you want to know what they do about it, write us and we will tell you! . . .

[This is the 1st in a series of Potter messages on meeting the problems which limit your profits. Number 2 will appear in the next issue of E. R. N.]

POTTER

Buffalo,



REFRIGERATOR CORPORATION

New York

AIR-CONDITIONING EQUIPMENT

Self-Contained, Portable Westinghouse Air Conditioner Operates at Low Cost & Is Easily Installed

By Howard A. Blair, Air-Conditioning Engineer
Westinghouse Electric & Mfg. Co.

THE new Type SW-5 Westinghouse air conditioner provides for simultaneous control of temperature, humidity, air motion, and air purification during the summer months. Operating charges for a typical office installation are as low as \$10.50 per season. The feature of portability minimizes installation expense and reduces field connections to a compound water hose, and an electrical attachment plug.

Quietness of operation is obtained by the Westinghouse hermetically sealed compressor construction, and by a novel screw-propeller type air circulating fan. The $\frac{1}{2}$ -h.p. direct-expansion refrigerating system is compactly designed within a volume of eight cubic feet and has a total weight of only 350 lbs. Water cooling removes both atmospheric and motor heat.

The most cogent argument for the portable, self-contained air conditioner is the fact that installation expense is only a small percentage of the equipment cost. In the case of air conditioners requiring remote compressor connections, installation expense often amounts to from 15 to 30 per cent of the cost of equipment.

Operating Costs

For a typical installation in Springfield, Mass., charges for a summer's comfort are \$10 for electricity and \$0.50 for water, or a total charge of slightly over three cents per operating hour for 350 hours per season with a rate of three cents per kwh. and water at 6.7 cents per 1,000 gal.

These charges are based on 50 per cent running time when the outside temperature lies between 70° F. and 80° F., and 100 per cent running time for higher outside temperatures, during the normal periods of occupancy of the office during May, June, July, August, and September, 1933. Operat-

ing charges for a domestic installation might run from 50 to 100 per cent higher than the above figures, depending on the user's habits and the bracket of utility rates in effect.

Application

Field connections required for the permanently located SW-5 air conditioner are a water supply pipe, a waste water pipe, a condensate drain pipe (which may be combined with the waste pipe), and connection to an electric circuit. All a.c. conditioners are designed for 110 to 125-volt service, at frequencies of 60 or 50 cycles. A 115 or 230-volt rotary converter adapts the standard a.c. conditioner to d-c. application.

Two toggle switches mounted in one end of the conditioner's outer cabinet permit independent control of the air circulating fan by one switch or electrically interlocked fan and compressor control by the other. Automatic control can be obtained by using an accessory room temperature thermostat mounted in the air stream within the conditioner cabinet, or located externally in the room.

An outside air duct is an optional item of equipment. The same fan which circulates the room air, draws in air from the outdoors and mixes the two air streams. Use of the air duct fixes the location of the conditioner near a window, of course.

Accessory equipment is available to make the entire apparatus (ex-

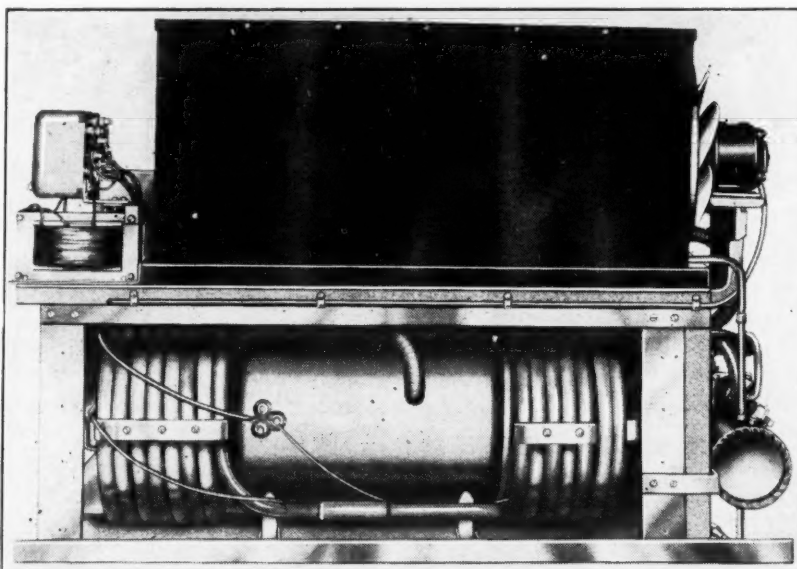
clusive of the air duct) portable. Mobility is provided by equipping the conditioner with ball-bearing, rubber-tired casters. The water and electrical connections are made by a flexible hose and separate electrical cord, each 25 ft. long.

The hose comprises three rubber tubes moulded in one piece, providing separate paths for the inlet cooling water, the outlet waste water, and the condensate from the evaporator. This hose can be permanently connected at the conditioner end, so that to move the conditioner it is necessary only to disconnect the inlet tube from the faucet or other pumping fixture, and remove the waste and condensate tubes from the sink. Only the water inlet tube requires a positive pressure connection.

The SW-5 conditioner is rated at 6,000 B.t.u. per hour at a room temperature of 80° F., and a relative humidity of about 50 per cent. For temperatures and humidities higher than these the capacity will be somewhat greater. The capacity is also dependent upon the inlet cooling water temperature. The ratio of heat removal effect to power input is approximately 2 to 1 under rated conditions.

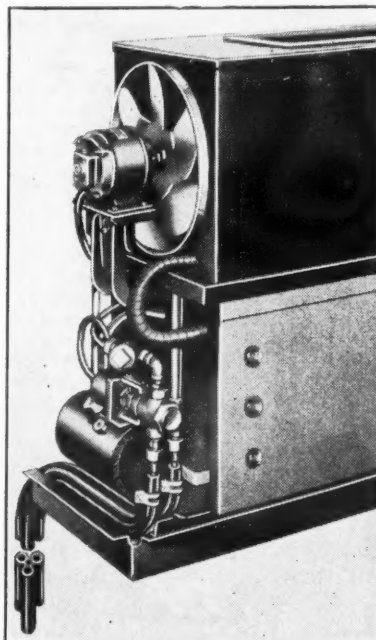
In combination with dehumidifying, the type SW-5 evaporator constitutes an effective air purifier. A wetted fin

Compact Arrangement



New Westinghouse self-contained room cooler, $\frac{1}{2}$ -ton capacity. Two $\frac{1}{4}$ -h.p. hermetic units are encircled by a water coil to remove motor heat.

New Type of Fan



Cooler with cover off, showing controls and the new type fan.

surface exceeding 9,000 sq. in. washes pollen and dust particles from the air as the equivalent air content of an average sized living room passes over this surface eight to ten times per hour.

Quietness

Freedom from vibration in the SW-5 conditioner has been obtained by spring-mounting and hermetically sealed compressor, by looping all connecting copper tubes to assure flexibility, by sound insulating the motor-compressor compartment with a 1-inch layer of Celotex, and by a new Westinghouse fan design. The combined noise level of compressor and fan with this construction is no greater than that of the ordinary 10-in. desk fan.

The 10 $\frac{1}{4}$ -in. fan, operating at 910 r.p.m., 25 watts, circulates air through the conditioner at the rate of 225 c.f.m. This performance is made possible by thin, streamlined blades which overlap to give a total angular coverage considerably greater than 360°. The pitch of the blades permits this interlocking design, as the overlapping portions of two adjacent blades are separated by the depth of the fan.

In fabricating the fan, sheet aluminum about 1/16 in. thick is die-pressed to form two separate sections, each consisting of three blades and a complete hub. Each section carries alternate blades of the complete fan, so that two sections intermesh to form the final 6-bladed fan. Assembly is by spotwelding the hubs together. This construction simplifies die requirements, and produces a symmetrical fan inherently well balanced.

The fan is mounted on the motor shaft by a rubber-cushioned brass bushing which isolates the air-actuating blades from motor hum. As an additional precaution, the motor bracket is mechanically insulated from the conditioner framework by rubber grommets.

The type SW-5 air conditioner consists of an inner assembly and a removable outer decorative cabinet.

The inner assembly may be considered as two compartments, the upper comprising the condensate basin and housing the finned-type evaporator, the lower the motor-compressor unit.

The upper compartment is constructed of reinforced, corrosion-proof brass, as it is subject to continual contact with moisture condensed from the air. In one end of the upper compartment is located the air circulating fan, with its motor

mounted externally. Room air reaches the fan through a cabinet end grille, is cooled and dehumidified as it passes up through the tilted evaporator, and is discharged through a grille in the top of the conditioner cabinet.

Proportioning the discharge air grille to produce an outlet air velocity of 500 feet per minute, and providing it with longitudinal guide vanes sloping at 20° with the vertical, produce satisfactory distribution of cooled air to an ordinary sized room without drafts.

Flow of liquid Freon to the evaporator is controlled in accordance with the cooling demand by a thermostatic expansion valve, located at the evaporator inlet. Refrigerant gas is returned to the compressor by a suction tube insulated to prevent condensation.

Freon gas leaving the compressor under high pressure is condensed in the water-cooled, counter-flow condenser. This consists of two concentric copper tubes, the inner carrying the water, and the annular space between the tubes conducting the Freon. The condensed Freon is stored in a liquid receiver at the end of the lower compartment.

Water discharging from the condenser enters a second series of (single) tubes which cools the motor-compressor unit. Mechanically, these cooling tubes are wound around the cylindrical surface of the motor shells and bonded to it with soft solder. The larger condenser coils are pre-wound and located over the motor cooling coils in assembly. An adjustable water-regulating valve automatically controls the water flow to maintain a constant discharge pressure, as pre-set for the most economical operating conditions. Water pressure drop through the piping is small.

Overload protection is furnished by two Spencer - disk cutouts, one mounted on each end of the motor-compressor shell, and connected in series with the electrical supply line to the motors. These disks have a combined current and ambient temperature characteristic. The compressors are provided with magnetic un-loaders to relieve pressure peaks.

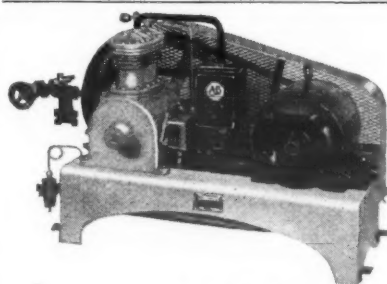
The conditioner's outer cabinet of furniture steel is structurally strong and artistically in good taste. Paneled finishes of grained walnut, mahogany, or a modernistic blue-green with an inlaid micarta panel are equally attractive.

Young Manufacturers Line Of Unit Coolers

RACINE, Wis.—Unit coolers varying in capacity from 6,000 B.t.u.s. per hour to 120,000 B.t.u.s. per hour are now being manufactured by the Young Radiator Co.

These units are made with cooling coils suitable for use with refrigerants such as methyl chloride, sulphur dioxide, and Freon. If required these units can also be built for use with ammonia and also for operation with cold water or brine circulating system.

The ceiling suspension-type cooler, because it takes no floor space, is suitable for commercial installations such as restaurants, shops, etc. Air distribution is accomplished by means of a propeller fan.



A New Line of FREON COMPRESSING UNITS and COMPRESSORS FOR AIR CONDITIONING

Nothing will contribute more to satisfactory and continued low operating cost of air conditioning equipment than this new line of condensing units, especially designed for Freon and Methyl Chloride. They are the last word in quality. Rugged, sturdy construction insures years of satisfactory service.

GALVANIZED STEEL FINNED COILS

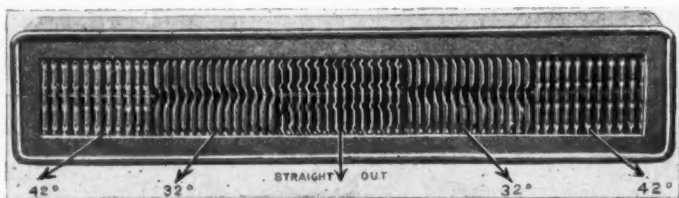
Original high efficiency will not "fade" due to oxidation between tubes and fins. Any desired size and capacity. Inquiries invited from contractors, engineers and builders of air conditioning equipment.

ONE-THIRD TO THIRTY TONS CAPACITY

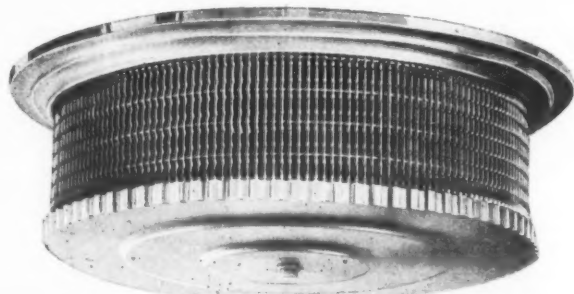
RELIANCE

REFRIGERATING MACH.
CO., 3409 N. KEDZIE
AVE., . . . CHICAGO

Consult UNI-FLO on Your Air-Distribution Problems



High velocity Five-way Air Flow Uni-Flo Outlet Panel, Model H-4200



Uni-Flo circular discharge outlet with adjustable volume and aspiration control for ceiling or cabinet installation.

UNI-FLO-Directional Air Flow Outlets direct the air to almost any desired position by using combination of different type cores. Air may be controlled to flow right, left, fan shape, or in up or down direction.

When air flows through UNI-FLO Outlets it is separated into ribbon-like thin sheets and by the aid of diffusers formed on the edges of the fins, the air is broken up at the face of the outlet in such a way that a rolling action to the air is created causing an aspirating effect at the face of the outlet that induces room air to mix with the discharged air thus tempering the air at the face of the outlet before its distribution throughout the room. This is a very desirable feature especially when refrigerated air is distributed, as the pre-tempering of the air at the outlet increases the distance of air delivery at lower velocities insuring quiet air discharge.

WHEN the air flow problem of your next air conditioning job comes up, keep in mind that Uni-Flo engineers have introduced many new ideas which have revolutionized past practice in air distribution. They have met today's problems with tomorrow's ideas. This modernization has been incorporated in all Uni-Flo grilles which are today being used in many of the largest and most modern air-conditioning installations.

To make this air distribution service more readily available for you we have established regional engineering offices where you may obtain valuable data and assistance in working out your problems.

Uni-Flo Corporation

General offices, laboratories and works
4646 Lawton Ave., Detroit, Mich.

Regional Uni-Flo Air-Distribution Engineers Located at

Preferred Utilities Co.
33 W. 60th St., New York, N. Y.

Meyer's Engineering Equipment Co.
702 Mart Bldg., St. Louis, Mo.

Uni-Flo Corporation
228 N. La Salle St., Chicago, Ill.

NEW EQUIPMENT

Fox Builds Year 'Round Conditioner

ELYRIA, O.—Fox Furnace Co., division of American Radiator and Standard Sanitary Corp., is now manufacturing the Sunbeam air-conditioning unit, a year-round central-system air conditioner.

For summer conditioning with the Sunbeam unit, a cooling coil is placed in the special duct at the rear of the blower-filter compartment. In summer the damper is closed, diverting the air circulation over the cooling coil to reduce the temperature and to dehumidify the air.

After the air is cooled and dehumidified, it is drawn by a blower through filters where the air is cleaned and purified. The air—being cooled, dehumidified and cleaned—next passes through the heating section (which is not fired during the summer) to the plenum chamber above, to which are connected the ducts which carry the conditioned air—cooled, dehumidified, and cleaned in summer; heated, humidified, and filtered in winter.

Large Heating Capacity

The heating equipment (coal or oil burning model) of the Sunbeam unit is constructed of heavy weight boiler plate, with all joints electrically arc welded to produce a seamless unit. Because of its large amount of heating surface and long fire travel, the heating element offers large heating capacity and economical fuel consumption, Fox Furnace Co. officials claim.

Blowers used in the Sunbeam unit operate at low speeds, and move a large volume of air at low velocities. Blowers and motors have extra capacity for summer cooling operations or to overcome greater than average resistance in the ducts.

Air Filters

Blowers are equipped with self-aligning bearings which can be oiled from outside the casing. Oil reservoirs are provided. The blower is securely fastened to the base to prevent vibration.

Air filters used in Sunbeam units are made of a porous material specially treated to remove all foreign matter suspended in the circulating air. They are approximately 2 in. thick, and will hold the equivalent of their weight in dirt, dust, lint, pollen and bacteria before replacement is required.

Control of Humidifiers

Spray humidifiers, controlled by a humidistat, are available for installations where humidity under automatic room control is desired. These humidifiers are of ample capacity to supply correct relative humidity during the heating season. The sprays are located at the top of the casing, centered above the heating element.

The humidistat controls the electric water valve. The electric water valve is wired so that when the humidistat calls for moisture the electric water valve cannot open unless the blower is running.

Operation of Blower

The blower cannot run unless heat is available in the bonnet. Therefore, moisture is never introduced unless there is heat and air movement to absorb and carry away moisture, thereby preventing any rusting of ducts.

The Sunbeam unit is also available with drip humidifier. This apparatus connects to the water line. A thermostatic element expands and contracts with the temperature in the bonnet to admit more or less water to the evaporating reservoir. The humidifier is placed in the bonnet directly above the center of the heating element. The amount of water evaporated by this humidifier is determined largely by the temperature in the bonnet and not by humidity requirements of the living quarters. This humidifier has a manual adjustment to vary the flow of water into the reservoir.

Refrigeration System

Any type of refrigerating system can be used in conjunction with the cooling and dehumidifying equipment in the Sunbeam unit. A pipe carries condensed moisture (from the dehumidifying process) to a drain.

Zone control—where specific temperatures or humidities are desired for certain rooms or portions of the house—is also possible with the Sunbeam unit. A thermostat is placed in one of the rooms in each zone. A trunk line or main duct with branches leads directly from the Sunbeam unit to each zone.

A damper which is operated by a motor is installed in each main duct. When a zone thermostat calls for heat, the duct damper motor opens the damper in the duct which it controls, turns on heat source and blower. When the thermostat is satisfied it closes the damper which it controls, turns off the heat source and blower.

G-E Offers Complete Air-Conditioning Equipment

NEW YORK CITY—General Electric's air-conditioning department includes in its 1934 line of equipment both unit cooling systems and central system air conditioners for summer service only, winter service only or year 'round air conditioning.

The G-E line of air-conditioning equipment is grouped under the headings of portable unit coolers, room coolers, store coolers, year 'round air conditioners, unit room air conditioners, and a central plant air conditioner.

The portable cooler is a self-contained cooling unit, mounted on wheels, designed especially to provide summer air conditioning in small offices, bedrooms, and the like. They circulate, cool, and dehumidify the air, and by virtue of the wet evaporator coils are effective in cleaning the air. They have flexible connections for water and power supply. This portable cooler has a nominal capacity

of 4,500 B.t.u.'s per hour.

This year General Electric is offering one wall-mounted and two sizes of floor-mounted room coolers, all designed to operate with remotely installed condensing units. Cabinets are easily removable. The two floor-mounted room cooler models have a capacity of 8,000 and 15,000 B.t.u.'s per hour, respectively, and the wall-mounted unit has a capacity of 15,000 B.t.u.'s per hour.

New Store Cooler

General Electric is also introducing a new store cooler with approximately 3 tons cooling capacity for commercial applications. This unit employs either direct expansion or water cooling with a newly developed propeller-type fan. It will be made available in two types, one for use with ducts, and the other for free delivery of air.

Two sizes of year 'round room-type air conditioners, with remotely installed condensing units, are included in the line. For summer air conditioning, each of the models provide for cooling and dehumidification, together with ventilation and filtering of both re-circulated and outside air.

In the winter the units provide heating, humidifying and filtering, and introduce outside air. The operation of the unit may be entirely au-

tomatic for heating, cooling and humidifying, the same thermostat taking care of both summer and winter operations. A unique method of air delivery makes it possible to maintain good temperature distribution in the room, both in summer and winter. The smaller model has a cooling capacity of 8,000 B.t.u.'s per hour, the larger, 15,000 B.t.u.'s per hour.

The smaller of these two room-type year 'round air conditioners can be combined with an enclosed condensing unit to make a self-contained year 'round air-conditioning unit for a single room.

General Electric also offers a central plant air-conditioning unit for use with the duct system for residential and commercial work, which may be used for winter service only or for year 'round air conditioning.

With a properly laid out duct system this unit lends itself to summer air conditioning by the addition of cooling equipment, with cooling surfaces to the return duct.

Heating is done by means of steam coils connected either to a central steam system or to the General Electric oil furnace or gas furnace. The heat exchanger principle is utilized, and the temperature is controlled by a heat exchanger thermostat.

Humidification is accomplished by the humidifier, which is a brass pan with a series of small holes in it

from which hot water (preheated in the steam chest of the air conditioner) slowly drips on to a series of ¼-in. mesh screens. As the warm air passes over these screens it absorbs moisture. Excess water drips onto a catch pan and is carried away by a drain.

The air is cleaned by passing it through dry type steel wool filters.

Fedders Builds Line of Heating & Cooling Coils

(Concluded from Page 1, Column 2)

The coils are available with either flat or corrugated copper fins, according to the type of installation.

Fedders air-conditioning coils are available in unlimited tonnage capacities for all requirements including room cooling in homes, offices, stores, buildings, and railroad cars.

Incorporated in their design is the Fedders fused metal-to-metal bond between copper fins and copper tubes. They are available for use with all standard refrigerants.

Fedders model 33 thermostatic expansion valve completes the low side assembly and provides a refrigerant control device specially suited in design and performance for the coils, Fedders engineers claim.

There Is
NO SUBSTITUTE
for
EXPERIENCE



LONG years of achievement have brought Servel to a position of dominance in the field of Commercial Refrigeration.

For more than a decade, Servel has maintained the highest standards for engineering genius and manufacturing skill.

Today, this famous old line is making new sales history in every part of the world.

★ ★ ★

Servel's line is built around a complete range of machine units—so flexible, so powerful, that they meet every demand for modern refrigeration. Exclusive features make them easier to sell, simpler to install, more economical to operate. This year, even more than before, they combine the rugged construction and precision workmanship that have established Ser-

vel's leadership throughout the years.

As the industry has grown, Servel has led the way in every major advancement. Through its alert engineering staff and through allied laboratories, Servel has constantly sought new ideas—tested them, proved them and improved them.

It was Servel, for instance, that pioneered the convection-type chilling unit, and in its exclusive Humidraft gave refrigeration users the first accurate control over temperature, humidity and circulation. It was Servel that modernized milk cooling and beer cooling, and made them simpler, more dependable, more economical.

★ ★ ★

With this rich background of experience in Commercial Refrigeration, it was only

natural that Servel should also take the lead in Air Conditioning.

For 1934, Servel has revolutionized all previous standards for Air Conditioning—removed the former price barriers—and put true, complete Air Conditioning actually within the reach of hundreds of waiting, eager prospects in every community.

Servel's Air Conditioning line includes equipment for every need—floor and suspended-type comfort units for year-round use, self-contained "package" room coolers, massive 7-ton and 10-ton machine units. All are based on Servel's wealth of experience as a refrigeration pioneer. All are helping to bring new volume and profits to the alert dealers who wisely decided to "share with Servel in 1934."

Servel Sales, Inc., Evansville, Indiana.

SERVEL

COMMERCIAL REFRIGERATION

★ HUMIDRAFT TRIPLE-CONTROLLED SYSTEMS ★ AIR CONDITIONING

★ MILK COOLERS ★ WATER COOLERS ★ BEER & BEVERAGE COOLERS

NEW EQUIPMENT

Carrier Introduces New 'Weathermakers' And Freon Units Up to 10 hp.

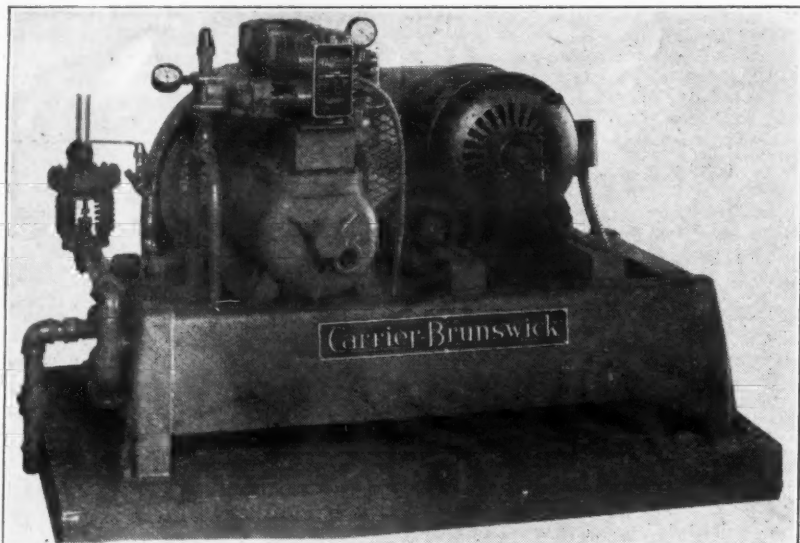
(Concluded from Page 1, Column 3) ways so as to operate as a vertical unit with vertical or side discharge, or a horizontal unit with horizontal discharge. It is lined with $\frac{1}{2}$ -in. insulating board to prevent condensation of moisture on the outside of the unit, and for sound absorption. Discharge outlets are provided with flanges for connection to sheet metal duct work.

The sectional-finned direct-expansion Aero-fin coils are proportioned for the maximum dehumidification at an economical refrigerant temperature, Carrier engineers state, and may be

heated pan type, constructed of brass and copper, with a float valve to maintain the proper water level. Bottom of the pan is free from obstructions and thus cleanable.

Fans are of the forward-curved multi-blade type, with one, two, or three fan wheels, depending on the size of the air conditioner. They are driven by V-belts (protected by a removable belt guard) from three-phase a.c. motors. A variety of fan speeds and drives is available to suit the requirements of various air distributing systems—ducts, Carrier slotted outlets, etc.

New Carrier Freon Unit



This year Carrier has introduced a new series of 2- and 4-cylinder condensing units using Freon in 5-, $7\frac{1}{2}$ -, and 10-hp. sizes.

connected up with two or three small compressors for flexible operation as two or three independent refrigeration systems.

A control box has expansion valves and solenoid valves used in the control combinations and conceals the refrigerant and steam connections. Heating coils are of special Aero-fin construction which relieves expansion and contraction strains. They may be used with high or low pressure steam or hot water.

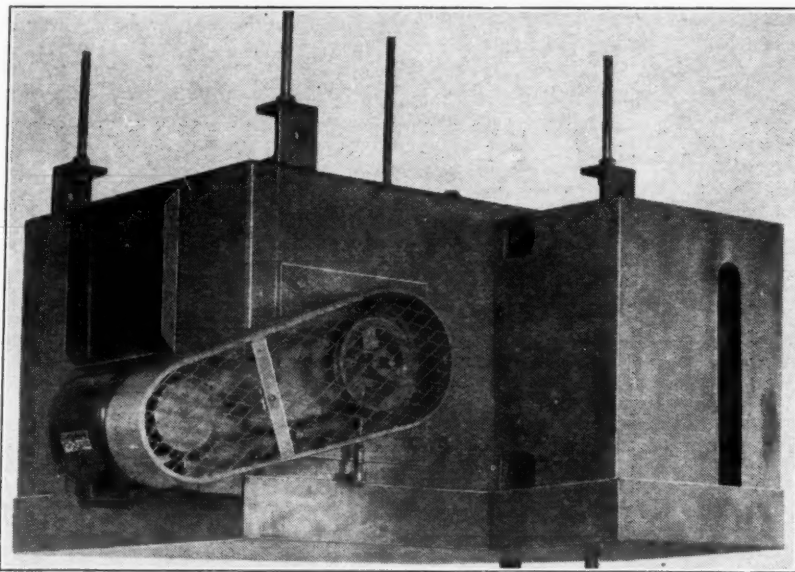
Filters are of the throw-away type, packed with wax-impregnated glass wool. All units have a drip pan section below the coils to drain off condensate.

The humidifier is of the steam-

The new Carrier-Brunswick condensing units are two- and four-cylinder reciprocating machines for methyl chloride or Freon. They are self-contained units, with motor, compressor, water valves, condenser, and receiver all on the same base, the condenser-receiver being of the shell-and-tube design built in the base.

Model 55-50 has a 5-hp. motor, and drives the two-cylinder compressor with five V-belts at standard speeds of 340 or 380 r.p.m. Model 56-75 is a four-cylinder machine driven by a $7\frac{1}{2}$ -hp. motor at standard speeds of 280 and 340 r.p.m. Largest model is 56-100 with a four-cylinder compressor driven by a 10-hp. motor at 380 or 450 r.p.m. as standard speeds. The

New Store 'Weathermaker'



Complete year 'round air conditioning is accomplished by the new Carrier conditioners which range in cooling capacity from 2 to 32 tons.

two largest models have eight V-belts. Bore on each of the new compressors is $4\frac{1}{4}$ in., while the stroke is 3 in.

Higher speed drives are offered for units with standard motor sizes for certain low suction temperatures when the use of constant pressure expansion valves prevents motor overloading, according to Carrier engineers. When these higher speed units are used for higher suction temperatures, or for low suction temperatures without constant pressure expansion valves, the next larger than standard motor size is furnished.

The condensing units are provided with a liquid strainer for insertion in the liquid line, a suction strainer, suction and liquid shut-off valves, pressure controls with high pressure cut-out, motor starter, etc.

Two-cylinder compressors are charged with five quarts of oil, and the four-cylinder machines with 10 quarts. After the initial operating period, the oil level should appear about $\frac{3}{4}$ in. above the bottom of the glass bull's eye on the side of the compressor crankcase. Refrigerant charge furnished with two-cylinder compressors is 20 lbs., and in the four-cylinder compressors, 25 lbs.

Air Conditioning Used In Banana Storage

SAN FRANCISCO—Air conditioning is being used for preservation of bananas, according to R. E. Fisher, vice president of the Pacific Gas & Electric Co., who states that a 35-hp. system was recently installed in the banana cooling room at a dock here.

Santa Fe Will Cool Four Limited Trains

CHICAGO—Santa Fe railroad this summer will air condition several new cars—including all Fred Harvey diners—on each of its limited trains, the "Chief," "California Limited," "Grand Canyon Limited," and "The Ranger."

The steam-jet refrigeration system, using water as a refrigerant and locomotive steam to produce the necessary vacuum will be employed to air condition these Santa Fe trains.

Refrigerating Chamber

The refrigerating chamber or evaporator in this system is an air-tight metal container, about one-fifth of which is filled with water. The space above the water is evacuated until the pressure is less than 1 in. of mercury per sq. in. This evacuation is accomplished by a steam jet through which the steam rushes past an opening in the evaporator at a velocity of from 3,500 ft to 4,500 ft. per second.

At the top of the evaporator is a horizontal pipe through which water is sprayed into the evaporator. Because of the extremely low pressure in the evaporator these sprays immediately flash into vapor.

As the latent heat of evaporation at this pressure is approximately 1,060 B.t.u.'s, the transformation of each pound of water into vapor requires this amount of heat. With no other source from which to obtain this heat other than the water in the bottom of the evaporator, this water is cooled to the temperature corresponding to the pressure maintained in the cooling chamber.

Steam Jet Carries Vapor

The vapor is carried along by the steam jet and as it passes through the narrow throat of the jet it is compressed. It then passes through the condenser, which is usually of the surface type. This condenser is generally cooled by the action of water sprays and air.

After the water in the evaporator is chilled to the desired temperature, it is pumped through the cooling coil where its temperature is raised by the absorption of heat in the air passed over the coil. The water is then returned to the evaporator and the process repeated.

Air Conditioning Proves Aid In Protecting Books From Deterioration

WASHINGTON, D. C.—That air conditioning is beneficial to libraries in cities where the atmosphere is polluted by sulphur dioxide gas is brought out in a new bulletin of the U. S. Department of Commerce. It is entitled "A Study of the Removal of Sulphur Dioxide from Library Air" and is available at five cents per copy from the Superintendent of Documents.

The bulletin reports tests made in the Folger Shakespeare Library (Washington) which showed that sulphur dioxide, which is harmful to paper, was not completely removed from the air by washing it with untreated water in an air-conditioning system of the usual type.

Effective elimination was obtained, however, on washing the air with water that had been treated with alkaline material at a rate sufficient to maintain the hydrogen ion concentration of the wash water within the range pH 8.5 to 9.0.

Sulphur dioxide content of the washing air was found to be entirely dependent upon the hydrogen-ion concentration of the wash water. The composition of a mixture of chemicals satisfactory for the treatment of the water is given in the bulletin.

Trane Conditioners Are of Four Types

LACROSSE, Wis.—The Trane Co. of this city is offering air-conditioning equipment in the form of cabinet-type floor-mounted room coolers, propeller fan units for wall mounting, suspension units for ceiling mounting, and high-velocity units for ceiling mounting.

Each type of Trane air conditioner is available in models which can be used either with a direct-expansion refrigerant or with chilled water or brine.

The cabinet-type room coolers for application with direct-expansion refrigerants provide cooled, dehumidified air for summer use, and may be equipped to provide heated air during the winter. The cooling capacity range of these models is from 18,360 B.t.u. to 97,500 B.t.u. (Capacities based on 85° F. entering air, 50 per cent relative humidity, and 40° refrigerant.)

Discharge Air from Top

The cabinet-type coolers discharge air from the top of the cabinet through the Trane Airflo grille, which is designed to permit air flow into the room at a slight angle from the vertical to assure proper distribution and to eliminate air pockets. The grille has a free area of approximately 90 per cent.

Slow-speed multi-blade fans bring the air into the cabinet at the bottom through the sides. Cooling and dehumidification is accomplished through a series of coils directly beneath the grille.

Cabinets Are Insulated

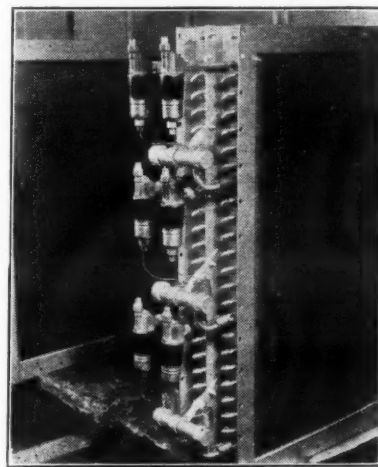
Cabinets are finished in black with nickel trim, and are insulated throughout with Gilsontite.

The cabinet-type conditioners for application with water or brine as the refrigerant have a capacity range of from 24,400 B.t.u. to 140,625 B.t.u.

The propeller fan unit is designed for summer conditioning only, and consists of propeller fan, coils, and eliminator plates.

These eliminator plates, through which the air is discharged into the

Trane Cooling Section



Sections of cooling coils with Airflo grille as seen in Universal Cooler plant.

room, pick up the globules of moisture from the air and drain to waste.

Where desired, the Trane Airflo grille can be installed in the casing directly in front of the eliminator plates.

Using a direct-expansion refrigerant, the propeller fan units have a cooling capacity range of from 10,500 B.t.u. to 44,000 B.t.u. Employing brine or chilled water the units have a capacity range of from 12,150 B.t.u. to 51,200 B.t.u.

The suspended blower units have two slow-speed multi-blade fans mounted at the rear of the unit and operated by one motor, which force the air through the conditioning coils and into the room through the eliminator plates. These units can also be equipped with the Airflo grille where desired.

Heating Possible

Trane suspended-blower units can also be equipped to provide heating for winter air conditioning.

The capacity range of these units using direct expansion refrigerants is from 18,360 B.t.u. to 97,500 B.t.u. Employing water or brine, these units range in capacity from 24,400 B.t.u. to 140,625 B.t.u.

The suspended high-velocity units are designed for conditioning large quantities of air. They provide cooled and dehumidified air for summer comfort.

They can be arranged for connection to duct work on the intake side, on the discharge side, or on both sides. They can be furnished with heat transfer coils for any refrigerant.

In design they are something like the suspended-blower units, except that the fans are driven by a special belt drive, and the air is discharged through louvers, or through diffusers or nozzle outlets if desired.

STREAMLINE Forged Brass Fittings in O. D. and Nominal Sizes for Mechanical Refrigeration and Air Conditioning



The increasing use of large capacity compressors and evaporators has created the necessity for non-porous fittings and hard drawn copper tube in suitable sizes for large suction lines. STREAMLINE forged brass fittings are now available in both nominal and O.D. sizes.

STREAMLINE forged brass fittings and hard copper pipe makes possible long runs without sags or kinks. A single straight tube of hard-drawn copper now takes the place of multiple lines of parallel small tubes.

STREAMLINE fittings are space savers. No room is required for wrench grip or swing as is necessary with screw type fittings. Lines may be installed close to each other and connected in a minimum of space.

The use of STREAMLINE fittings assures permanently tight connections for electric refrigeration and air conditioning work. They are absolutely refrigerant and seep-proof. Vibration cannot work them loose. They form a connection actually stronger than the tubing—yet much lighter and more quickly completed. They reduce your fitting cost approximately 50%.

The STREAMLINE fitting is the only solder type fitting on the market that furnishes its own visual assurance of a leak-proof, perfectly bonded joint without an actual pressure test.

We manufacture a complete range of forged brass electric refrigeration valves and fittings and better still, can make immediate shipment.

SEND FOR OUR NEW CATALOG R-2

MUELLER BRASS CO.
Port Huron, Michigan

NEW EQUIPMENT

York Installs Cooling Equipment in Burlington Streamlined Train

(Concluded from Page 1, Column 4)
trains of like capacity. The new train will develop a service speed of approximately 100 miles per hour.

The air-conditioning equipment of the train is of special light-weight construction throughout, in compliance with specifications which stipulated that the total weight of the complete air-conditioning system, with auxiliary equipment, should not exceed 3,000 lbs.

Specially Designed Accessory Equipment

The condensers, compressors, fans and accessory equipment of the system were especially designed by York engineers for this train, and were more or less complicated and extremely compact, in view of the small space in which the equipment must be installed, and the light-weight construction required.

All of the fans, as well as outer casings for the condenser and compressor units, are of aluminum. The compressor unit is as large as can be accommodated in the limited space. In fact, the installation of this system involved several mechanical problems in order to fit the several units of air-conditioning equipment into the small space between the car floor and the outside finish sheets beneath the car, where the superstructure resembled to a great extent that of a dirigible, with struts running in all directions.

Cooling the Condenser a Problem

The chief engineering problem involved was to install the equipment in such a manner that the outside air would pass over the condenser, York engineers state, as well as over the compressors and through the fans.

All parts were designed and constructed to eliminate unnecessary weight. Flexible pipe connections were used, with joints specially sweated to eliminate possibility of leakage, and to insure most efficient application in the congested space beneath the cars. Equipment with moving parts was mounted on rubber insulating pads to reduce vibration and to insure quietness in operation.

Windows Sealed

The windows of this train are sealed, the air-conditioning system being so designed that a constant volume of fresh, filtered air is circulated through the train, and all stale air is exhausted from the train. Air distribution is by means of bulkhead delivery. Air ducts of irregular shape are designed to fit compactly into the spaces between each car's structural members. Freon is the system's refrigerant, controlled by thermostatic expansion valves.

The York air conditioning equipment consists of the following units:

List of Equipment

3-2½x2½ in. (4-28FA) F-12 compressors complete, with flywheels, cut-outs, gauges, valves and necessary accessories.

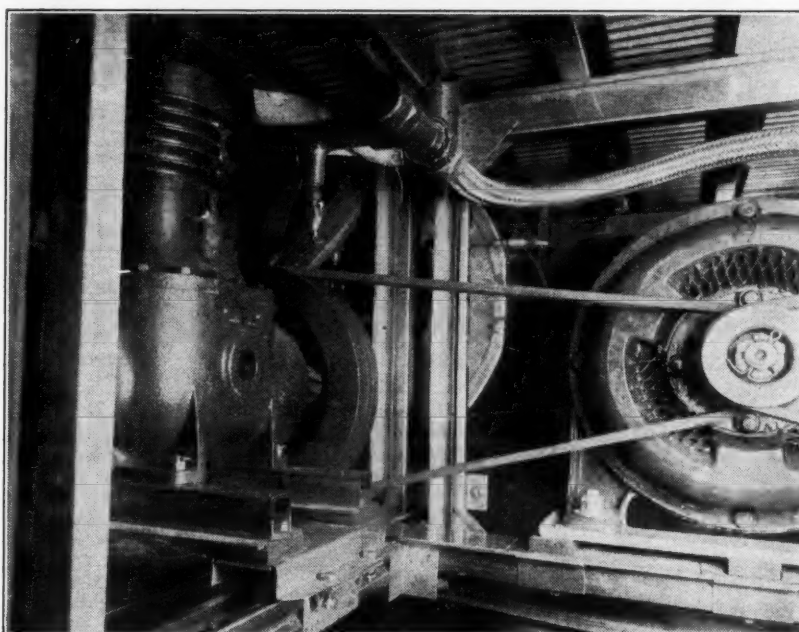
3-Air-cooled condenser coils complete, with two high-pressure liquid receivers, liquid indicator and purge valve.

3-Evaporator units complete, with heating and cooling finned coil, aluminum fan assembly, aluminum casting and drip pan.

3-Thermal expansion valves, refrigerant controls, including strainers, valves and auxiliary equipment.

The York equipment used on the train will carry a weight of 1584 lbs., which, together with 818 lbs. added as

Compressor in New Railroad Car



"Under the hood" of Burlington's new high-speed streamlined train, showing the York compressor used for air conditioning.

the weight of necessary electrical equipment, such as motors, controls, etc., gives a total weight for this equipment of 2402 lbs. This weight includes the bare equipment only, and does not cover the weight of refrigerant lines, water lines or electrical cables.

For a view of the York compressor, electric motor, and drive equipment, see the picture above.

This train, the first of its kind ever to be built, has been designed in every particular for high speed and economical operation. It embodies, in every detail of its equipment and furnishings the "last word in comfort," and deluxe traveling conditions for railway passengers.

Air Recirculated by Edwards System

CINCINNATI—Air conditioner made by the Edwards Mfg. Co. of this city is a unit designed to recirculate filtered, humidified, warm air in winter, and may be used with refrigeration for cooling in summer. It is furnished with either a gas- or oil-fired heating compartment.

In operation, air is drawn through the return registers into the unit by a blower, then sucked through a replaceable filter of steel wool or spun glass. It is then forced downward, counterflow to outgoing hot gases.

The air thus enters the unit at the top, beginning the process of "wiping" the heat from the flue gases where these gases are coolest. As the air continues through the heat exchanger, it comes in contact with the hotter surfaces, and finally takes a complete travel around the combustion chamber.

Discharge registers are located 6½ ft. from the floor, while return registers are located in the base.

"Hot-Kold" is available in two sizes, each using gas or oil fuel.

Westinghouse Refines Air Conditioners

EAST PITTSBURGH, Pa.—Refinements have been made in all air-conditioning equipment in the Westinghouse line, including floor-type units of 1 ton, suspended types from 1 to 6 tons, and air- and water-cooled condensing units from 1 to 6 tons for all commercial electric circuits—ac., d.c., 25, 50, or 60 cycle.

New units added this year include a ½-ton self-contained summer air conditioner (Moblair), and a 12-ton condensing unit.

The Westinghouse dealer organization has been extended to give service in all important centers, and advertising and sales promotion campaigns are being conducted in major markets.

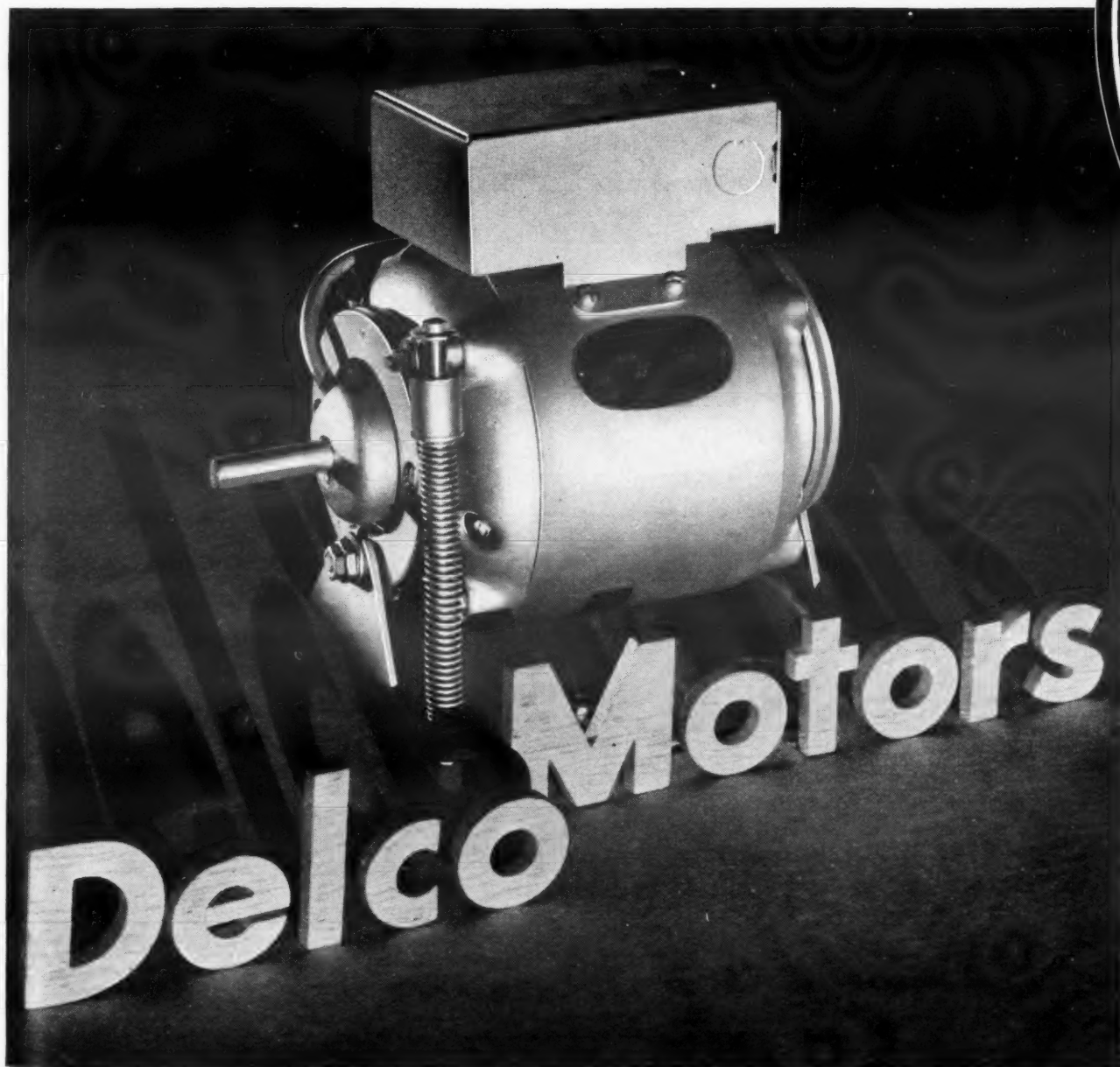
Humidi-Cooler to Bring Out Air Conditioners

WEST HAVEN, Conn.—Within the next few weeks the Humidi-Cooler Corp., manufacturer of forced-draft cooling units for commercial refrigeration application, will introduce a new type air conditioner, officials of the company have announced.

According to the Humidi-Cooler Corp. officials, the new equipment will attack the air-conditioning problem from the angle of tempering the condition of the inside or room air in direct relation to the outside temperature.

THESE 4 DELCO FEATURES

help sell your product and keep it sold



- 1 Automatic Belt Tightener**—stops the continual whipping of the belt. The spring maintains the proper tension, while a rubber snubber provides enough friction to prevent motor oscillation.
- 2 End-Play Take-Up**—objectionable end-play noises have been abolished by a special cork end-play take-up which cushions the movements of the shaft.
- 3 Vulcanized Rubber Cradle Mounting**—permanently isolates motor hum and vibration. This special mounting allows full flexibility of the shaft, yet curbs any tendency toward mis-alignment.
- 4 Sealed Lubrication**—stops loss of oil during shipment, installation and operation. A patented oil reservoir prevents over-oiling, seepage and any leakage on the windings.

Due to proper engineering and precision of manufacture—plus the four above Delco features—Delco motors today are setting the pace in the electrical motor field. So successful have the Delco engineers been in reducing wear, noise, vibration and maintenance to a minimum that it is not unusual for users of these motors to expect continued dependable service. These four features should not be overlooked by any manufacturer in search of specialized equipment that will not only help sell his product, but keep it sold!



DELCO PRODUCTS CORPORATION, DAYTON, OHIO

AIR-CONDITIONING EQUIPMENT CLASSIFIED BY FUNCTIONS

A table of companies manufacturing air-conditioning equipment, classified according to functions performed by their equipment. The following functions of complete air conditioning are considered: refrigeration, dehumidification, cleaning, circulation, heating,

and humidification. The first alphabetical classification shows manufacturers of equipment which serves to condition air in all seasons (some of the companies in this group also make systems for summer only, or for winter only). Next list on this page gives manu-

facturers of summer "comfort cooling" systems only. On page 13 are manufacturers of winter air-conditioning systems (cleaning, circulation, heating, and humidification), and the second list on page 13 shows companies manufacturing humidifiers.

Summer and Winter Functions	Summer Functions		All-Year Functions		Winter Functions	
	Refrigeration	Dehumidification	Cleaning	Circulation	Heating	Humidification
Air Conditioning Engineers, Inc. "Ace" 918 E. Preston St., Baltimore, Md.	Electric refrigeration	Cold water spray	Water spray	Blower	Steam	Water spray
American Blower Corp. 6000 Russell St., Detroit, Mich. Series "O" Sirocco	Electric, ice, or steam jet	Cold surface	Filter	Sirocco fans	Hot water	Evaporation
Air Conditioning Industries, Inc. 101 Park Ave., New York, N. Y. "Zephyr Air"	Electric, ice, tap water, or steam jet	Cold surface	Bag filter	Sirocco fans	Hot water	Water spray atomizer
Bayley Blower Co. 1817 S. 66th St., Milwaukee, Wis.	Electric or steam jet	Cold water spray	Water spray or filter	Fans	Steam	Water spray
Buffalo Forge Co. "Buffalo Comfort Cooler" Buffalo, N. Y.	Electric refrigeration	Cold finned core and cold water spray	Dense water spray	Blower type fan	Steam or hot water	Dense water spray
Betz Unit Air Cooler Co., Inc. "Unicool" 6 W. Ninth St., Kansas City, Mo.	Electric or ice	Spray	Spray	Blower	Steam or hot water	Spray
Campbell Metal Window Corporation, 40 W. 40th St., New York, N. Y. Campbell and Maxim Silencer	Electric refrigeration	Cold evaporator surface	Water spray	Centrifugal fan	Steam coil	Water spray
Carrier Products Corp. "Weathermaker" 850 Frelinghuysen Ave., Newark, N. J.	Electric or steam ejector refrigeration	Cold evaporator surface	Filter	Centrifugal fan	Steam or hot water	Evaporation by heating water
Continental Air Conditioning Co. "Kingly" 505 W. 162nd St., New York, N. Y.	Electric refrigeration	Cold evaporator surface	Filter	Blower	Warm air or steam	Spray
Cooling & Air Conditioning Corp. Damon St., Hyde Park, Mass. "Sturtevant"	Electric	Cold surface or spray	Filters or spray	Fan	Hot air	Evaporation by heating water
Dall Steel Products Co. "Dallaire" Main & Hosmer Sts., Lansing, Mich.	Electric refrigeration	Cold evaporator surface	Filter and water spray	Blower	Steam or hot water	Spray
De La Vergne Engine Co. "De La Vergne" Philadelphia, Pa.	Electric refrigeration	Cold evaporator surface	Filter	Fan	Warm air	Water spray
Economy Baler Co. No. Main St., Ann Arbor, Mich. Health-Air Systems	Not furnished but can be used with refrigeration systems	Cold water spray if tap water is cold enough or refrigeration system is used	Water spray. Filter can be used in conjunction	Blower	Reversing refrigeration cycle as heat pump	Evaporation and atomizing
Fox Furnace Co. "Sunbeam" Elyria, Ohio	Electric refrigeration	Cold evaporator surface	Filter	Blower	Warm air	Water spray
Frigidaire Corp. Dayton, Ohio	Electric refrigeration	Cold evaporator surface	Filter optional	Fan	Steam or hot water	Evaporation by heating water
General Electric Company, Air Conditioning Dept., 570 Lexington Ave., New York, N. Y.	Electric refrigeration	Cold evaporator surface	Dry filters	Propeller fan	Steam or hot water	Hot water flowing over sets of screens
Grinnell Co. Providence, R. I. "Thermolier-Air Conditioning Type"	Electric refrigeration	Cold evaporator surface		Propeller fan	Steam	
Herman Nelson Corp. Moline, Ill.	Electric	Cold surface	Filter	Centrifugal fan	Steam or hot water	Spray
Holland Furnace Company, Holland, Mich.	Electric refrigeration	Sprayed evaporator surface	Filter and water spray	Centrifugal blower	Warm air	Water spray
Ilg Electric Ventilating Co. "Ilg" 2850 N. Crawford Ave., Chicago, Ill.	Electric refrigeration	Cold evaporator surface	Filter	Fan (centrifugal or propeller)	Hot water	Spray
Kauffman Air Conditioning Corp. 4485 Olive St., St. Louis, Mo.	Electric refrigeration	Cold evaporator surface	Filter	Fan	Steam	Water spray
Kelvinator Corp. "Kelvinator" 14250 Plymouth Road, Detroit, Mich.	Electric refrigeration	Cold evaporator surface	Filter	Centrifugal fan	Steam or hot water	Water spray
Lakeside Co. "Fairweather" Hermansville, Mich.	Electric refrigeration	Cold water spray	Filter and spray	Blower	Warm air	Spray
Lewis Air Conditioners, Inc., 829 Second Ave., South, Minneapolis, Minn.	Circulates ice water through heat absorber	Cold surface of heat absorber	Filters	Fan	Steam or hot water	
McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. Convactor	Circulates cold water cooled by electric refrigeration or ice	Cold evaporator surface	Moist surfaces	Fan	Hot water	
J. H. McCormick & Company, Williamsport, Pa. Airtrol	Electric refrigeration or cold water cooled by electric refrigeration or ice	Finned radiator surface	Filters	Fans	Steam	Wicks controlled by hydrostat or steam jets
L. J. Mueller Furnace Co. "Climator" 2005 W. Oklahoma Ave., Milwaukee, Wis.	Electric refrigeration	Cold evaporator surface or cold water spray	Filter and water spray	Blowers	Warm air	Water spray or automatic humidifier
Niagara Blower Co. "Niagara" 6 E. 45th St., New York, N. Y.	Electric refrigeration or ice	Cold evaporator surface or cold water spray	Filter and water spray	Fans	Steam	Water spray and evaporation by heating water
Parks-Cramer Co., 970 Main St., Fitchburg, Mass. Parkspray Certified Climate	Electric refrigeration or steam jet	Cold water spray or evaporator surface	Filter and water spray	Fan	Steam, hot water, warm air or electric heaters	Water spray
Servel Sales, Inc., 119 N. Morton Ave., Evansville, Ind.	Electric refrigeration	Cold evaporator surface	Filter	Blower	Hot water	Evaporation
H. J. Somers, Inc. 1984 W. Lafayette Blvd., Detroit, Mich.	Ice or electric	Cold surface	Filter	Centrifugal fan	Steam or hot water	Spray
B. P. Sturtevant Company, Hyde Park, Mass.	Electric refrigeration or ice	Cold evaporator surface or water spray	Filter or water spray	Fans and blowers	Steam, hot water vapor or warm air	Water spray and evaporation by heating water
The Trane Co. "Climate Changer" Second & Cameron Aves., La Crosse, Wis.	Electric refrigeration, ice or cold water	Cold evaporator surface or cold water	Filter and water spray	Fan	Steam or warm air	Evaporation
United States Air Conditioning Corp. 2131 Kennedy St., N. E., Minneapolis, Minn. Kooler-Aire, Arctic Nu Air and Balmi-Aire	Electric refrigeration	Cold water spray when and as required	Water spray or flooding nozzles	Centrifugal fan	Steam, hot water or warm air	Water spray
Westinghouse Electric & Mfg. Co. East Pittsburgh, Pa.	Electric refrigeration or steam jet	Cold surface	Filter	Propeller fans	Steam, hot water from existing systems	Water spray
The Williamson Heater Company, 337 W. 5th St., Cincinnati, Ohio DeLuxe Comfort System	Electric refrigeration	Cold evaporator surface	Adhesive type filters	Centrifugal blowers	Warm air	Spray or evaporation of heated water
Wittenmeier Machinery Co., 850 N. Spaulding Ave., Chicago, Ill.	Electric	Refrigerated spray	Filter	Centrifugal fan	Steam or hot water	Spray
X L Refrigeration Co., Inc., 1834 W. 59th St., Chicago, Ill. Hilger	Electric refrigeration	Cold water or brine spray	Water spray	Propeller fan	Steam	Water spray
York Ice Machinery Corp. York, Pa. "York Ready Weather"	Electric refrigeration	Cold evaporator surface or water spray	Water spray and filter	Fans through ducts or direct	Duplex cooling and heating surface	Mist-type humidifier
Young Radiator Co. "Young Quality" 709 Mead St., Racine, Wis.	Electric refrigeration or ice	Cold evaporator surface		Propeller fan	Hot water or steam	

Summer Functions	Summer Functions		All-Year Functions		Winter Functions	
	Refrigeration	Dehumidification	Cleaning	Circulation	Heating	Humidification
Audiffren Refrigerating Sales Co. 9 Coddling St., Providence, R. I.	Electric refrigeration	Cold evaporator surface	Filter	Blower		
Baker Ice Machine Co., Inc. "Baker" 1522 Evans St., Omaha, Nebr.	Electric refrigeration	Cold evaporator surface	Filter or spray	Blower		
Barrett Regulation Engineers Co. "Breco" 1322 Warrenville Center Rd. Cleveland Heights, Ohio	Ice	Cold surface	Wet surface	Propeller fan		
Chicago Pump Co. "Northern Breeze" 2336 Wolfram St., Chicago, Ill.	Ice	Cold surface of fin-type radiator	Water	Blower		Evaporation by heating water
Howe Ice Machine Co. 2825 Montrose Ave., Chicago, Ill.	Electric	Cold surface	Filter	Blower		
H. S. Kaiser Co. "IceAir & Kaiserair" 936 W. Chicago Ave., Chicago, Ill.	Ice	Ice surface	Filter	Fan		
Modine Mfg. Co. "Ice Fan" Racine, Wis.	Ice	Ice surface		Fan		
Motors Metal Mfg. Co. "Komforte Koolaire" 5936 Milford Ave., Detroit, Mich.	Ice	Cold ice surface		Fan		
Reliance Refrigerating Machine Co. 3401 N. Kedzie Ave., Chicago, Ill.	Electric	Cold surface	Filter	Blower		
Scott-Newcomb, Inc. "Pioneer Room Cooler" 1947 Pine St., St. Louis, Mo.	Electric refrigeration	Cold evaporator surface		Fan		
Strang Air Conditioning Corp. Commerce Bldg., Kansas City, Mo.	Electric refrigeration	Cold evaporator surface		Fan		
Unit Heater & Cooler Co. 1002 Third St., Wausau, Wis.	Electric	Cold surface	Filter	Propeller fan		
Universal Cooler Corp., 7424 Melville Ave., Detroit, Mich.	Electric refrigeration	Cold evaporator surface	Filter and water spray	Fan		
The Vilter Mfg. Co. "Vilter" 2234 S. 1st St., Milwaukee, Wis.	Mechanical refrigeration	Cold surface		Fan		
L. J. Wing Mfg. Co. 154 W. 14th St., New York, N. Y.	Electric	Cold surface	Filter	Propeller fan		

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Winter Functions	Summer Functions		All-Year Functions		Winter Functions	
	Refrigeration	Dehumidification	Cleaning	Circulation	Heating	Humidification
Air Controls, Inc. 1960 W. 114th St., Cleveland, Ohio			Filter	Fans	Warm air	Evaporation
The Edwards Mfg. Co. "Hot-Kold" 407 Eggleston Ave., Cincinnati, Ohio			Filter	Centrifugal fan	Warm air	Evaporation from heating water
Forest City Foundries Co. "Niagara" 2500 W. 27th St., Cleveland, Ohio				Blower	Warm air	Direct evaporation
Gar Wood Industries, Inc. "Gar Wood" 7924 Biopelle St., Detroit, Mich.			Filter and water spray	Blower	Steam or warm air	Water spray and evaporation of heating water
Grand Rapids Die & Tool Co. "Propaire" 113 Michigan St., Grand Rapids, Mich.			Filter	Centrifugal fan	Warm air	Spray
Hess Warming & Ventilating Co. "Hess" 1211-17 S. Western Ave., Chicago, Ill.			Filter	Centrifugal blower	Warm air	Wire mesh wheel breaks up water into fine spray
Home Furnace Co. "Home Air Conditioner" Sixth St. & P. M. Ry., Holland, Mich.			Filter and water spray	Blower	Warm air	Water spray
International Heater Co. "Economy" 101 Park Ave., Utica, N. Y.			Filter or spray	Blower	Warm air	Water spray or evaporation of heating water
Lennox Furnace Co. "Aire-Flo" Marshalltown, Iowa			Filter and water spray	Blower	Warm air	Water spray by whirling disc
Motor Wheel Corp. "MW Weather Control" Lansing, Mich.			Filter or water spray	Blower	Warm air	Evaporation by heating water
Pennsylvania Furnace & Iron Co. Pine St., Warren, Pa.			Filter	Blower	Warm air	Evaporation by heating of water
Pratt & Whitney Air Heater Co., Dowagiac, Mich.			Filter and water spray	Twin blowers	Warm air	Water spray
Perfection Stove Co. "Superfex" 7600 Platt Ave., Cleveland, Ohio			Filter	Blower	Oil-burning air circulating system	Evaporation of water
Robinson Furnace Co. 213 W. Austin Ave., Chicago, Ill.			Spray and filter	Blower	Warm air	Spray
George D. Roper Corp. "Roper" Blackhawk Ave., Rockford, Ill.			Filter	Fan	Hot air	Evaporation by heating of water
Rudy Furnace Co. "Rudy" Prairie Ronde St., Dowagiac, Mich.			Filter and water spray	Centrifugal fan	Warm air	Evaporation
Security Stove & Mfg. Co. "Security" 1630 Oakland Ave., Kansas City, Mo.			Filter	Fan	Hot air	Spray
Thatcher Co. "Thatcher" Thatcher Bldg., Newark, N. J.			Filter and water spray	Blower	Hot air	Water spray

Manufacturers
Of Humidifiers

Air Conditioning Engineers, Inc.
915 E. Preston St., Baltimore, Md.

Air Controls, Inc.
Div. of Cleveland Heater Co.
1960 W. 114th St., Cleveland, Ohio

American Foundry & Furnace Co.
915 Washington St., Bloomington, Ill.

American Radiator Co.
40 W. 40th St., New York, N. Y.

Barrett Regulation Engineers Co., Inc.
1222 Warrensville Center Rd.
Cleveland Heights, Ohio

Betz Unit Air Cooler Co.
6 W. Ninth St., Kansas City, Mo.

Bishop & Babcock Sales Co.
4901 Hamilton Ave., Cleveland, Ohio

Campbell Metal Window Corp.
100 E. 42nd St., New York, N. Y.

Carrier Engineering Corp.
850 Frelinghuysen Ave., Newark, N. J.

Cary Mfg. Co., Waupaca, Wis.

Drying Systems, Inc.
1800 Foster Ave., Chicago, Ill.

Emerson Electric Mfg. Co.
2012 Washington Ave., St. Louis, Mo.

General Electric Co.
Air-Conditioning Dept.
570 Lexington Ave., New York, N. Y.

Gilbert Co., A. C., New Haven, Conn.

International Heater Co.
101 Park Ave., Utica, N. Y.

Kaiser Co., H. S.
936 W. Chicago Ave., Chicago, Ill.

Lau Heating Service, Inc.
3116 N. Main St., Dayton, Ohio

Lewis Air Conditioners, Inc.
829 S. Second Ave., Minneapolis, Minn.

Montag Stove & Furnace Works
2011 N. Columbia Blvd., Portland, Ore.

Murray & Nickell Mfg. Co.
2612 Arthington St., Chicago, Ill.

Niagara Blower Co.
6 E. 45th St., New York, N. Y.

Norge Corp.
670 E. Woodbridge, Detroit, Mich.

Nugent Sons, Inc., Thomas
223 E. 80th St., New York, N. Y.

Parks-Cramer Co.
Main St., Fitchburg, Mass.

Penn Electric Switch Co.
340 E. Walnut St., Des Moines, Iowa

Rudy Furnace Co.
Prairie Ronde St., Dowagiac, Mich.

Russell Electric Co.
340 W. Huron St., Chicago, Ill.

Security Stove & Mfg. Co.
1630 Oakland Ave., Kansas City, Mo.

Somers, Inc., H. J.
1984 W. Lafayette Blvd., Detroit, Mich.

Swartzbaugh Mfg. Co.
1336 W. Bancroft St., Toledo, Ohio

Thermal Units Mfg. Co.
39th & Loomis Sts., U. S. Yards
Chicago, Ill.

Timken Silent Automatic Co.
100 Clark St., Detroit, Mich.

Trane Co., The
Second & Cameron Aves., La Crosse, Wis.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Workrite Specialty Co.
2855A N. 28th St., Milwaukee, Wis.

Young Radiator Co.
709 Mead St., Racine, Wis.

136 Prospects Secured
At Cooking School

BRADDOCK, Pa.—A total of 136 live prospects, and 38 additional prospects who declared their intention of purchasing a refrigerator at a future date, was secured at a cooking school sponsored here recently by the Home Furniture Co., Crosley dealer.

The cooking school was under the direction of the staff of the Anchor Lite Appliance Co., Crosley distributor for western Pennsylvania.

The demonstration of the advantages of the modern electric refrigerator was brought home to those attending the school by means of a playlet, planned and produced by Mrs. Theal Grant, home economist.

The demonstration opened with Mrs. Grant in the role of a housewife using an obsolete non-mechanical refrigerator. Preparing a meal for her husband, she decided to make his favorite cake. Upon opening the refrigerator, she proceeded to extract an egg—with numerous mishaps.

First a bottle of cream was upset, then an egg was broken, and this part of the skit ended with the housewife deciding to purchase an up-to-date refrigerator.

"Trying on" need not be trying!



"FREON"
*keeps customers cool...
helps make sales!*



Top picture shows women's smart shop which is air-conditioned with "Freon" by Westinghouse. Below are interior and exterior views of Finchley's, New York City. This store is air-conditioned with "Freon" by Westinghouse Air-Conditioning System.

A NEW selling force is rapidly entering the shops and department stores of the country. It is air-conditioning. It is a distinct selling force because it induces a buying mood.

Cool, inviting comfort. On hot, humid, summer days, it brings shoppers in, soothes their nerves after they're in, makes them stay longer and buy more. Many merchants whose establishments are air-conditioned no longer consider summer as a bad "off season." And they know the sales value of fresh, pure air in winter, too!

The refrigerant most widely used for air-conditioning in stores is "Freon." This refrigerant is safe and cannot harm patrons or goods in any manner whatever. "Freon" is non-toxic, non-flammable, odorless. Even if the evaporator were punctured and "Freon" escaped into the store, it would do no harm. Customers would not be aware of it. No odor would cling to their garments.

It is for these reasons that "Freon" is today the preferred refrigerant for air-conditioning in hotels, office buildings, apartments, restaurants, trains—and for air-conditioning and refrigeration in meat markets, delicatessens, florists' shops, household refrigerators, museums and libraries. "Freon" is used wherever a safe refrigerant is required.

FREON
REG. U. S. PAT. OFF.
a safe refrigerant


ELECTRIC REFRIGERATION NEWS

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EDITORIAL AIMS

To encourage the development of the art.
To promote ethical practices in the business.
To foster friendly relations throughout the industry.
To provide a clearing house for new methods and ideas.
To broadcast the technical, commercial, and personal news of the field.

VOL. 12, No. 1, SERIAL NO. 267, MAY 2, 1934

A Proposal on Air Conditioning

TEN years ago electric refrigeration men were saying: "Before we can sell the product we'll have to sell the idea." During the following year (1925) the chief executives of half a dozen companies, constituting the bulk of the capital investment in the new industry, were brought together for the purpose of discussing their common problems. As might have been expected, there was some toying with proposals of the Anti-Sherman variety, but nothing was accomplished in this direction.

Early in 1926 they did agree upon a cooperative program "to sell the idea" of electric refrigeration to the public. They put up one hundred thousand dollars, each of the six members paying an equal portion, namely \$16,666.66. Considering the several millions of dollars which have been spent since that time to advertise electric refrigeration—and considering the truly magnificent results thereof—that original cooperative effort now seems somewhat puny. At the time, however, it appeared to be a rather lavish expenditure for educational purposes. It called for some broad-gauge thinking on the part of some top executives to toss that much money into a pot.

A Parallel Situation

Did that \$100,000 program really "sell the idea" of electric refrigeration to the public? Certainly not. Did it even help sell the idea? Well, maybe a little. But there was at least one thing accomplished by the plan—and that one result was probably worth the price. We bring up this bit of history because we believe that there is a parallel situation in the air-conditioning industry today. Furthermore, we believe that it offers a valuable suggestion to this budding industry.

In order to carry out the cooperative program to sell the idea of electric refrigeration to the public, it was necessary to appoint a series of committees to supervise the job. The advertising managers of the member companies, together with their advertising agency account executives, were designated a committee to work out the details of the cooperative advertising campaign.

Establishing Promotion Fundamentals

This committee went at its job with no less enthusiasm and seriousness than the framers of the Constitution of the United States. Days and nights were spent in arguing the psychology of the housewife, the technique of copy, the merits of media. And it was no fruitless argument,

because the net result was an agreement regarding many of the major premises upon which all subsequent electric refrigeration advertising has been based.

Specifically, there was an agreement upon many items of terminology—words that were good and words that were bad, words which the housewife and the public generally could understand. There were important agreements in regard to policy—things which were constructive, and things which were destructive to the best interests of the industry as a whole from a long-range viewpoint.

Agreement Upon Terminology

For example: they decided to call it *electric* refrigeration rather than any of the half-dozen other names which were suggested. They discarded the term "boiler" (a word commonly used up to that time to designate the evaporator) and agreed upon "cooling unit" as a simpler and more understandable term. They voted to "lay off" the ice man and his dirty feet—the popular theme of all beginners in electric refrigeration advertising. They listed and rated the basic appeals: pride of possession, health, convenience, etc. In a similar manner numerous other fundamental questions were debated to a decision.

We venture a guess that if none of the cooperative advertisements which were born out of this travail had ever reached the public, the real benefits of this enterprise would have been achieved and, as previously suggested, would have been well worth the cost.

Confusion in Air Conditioning

Now consider the parallel with air conditioning. Here we have a new industry of great promise. There is tremendous public interest in the subject. Apparently there is no real need to "sell the idea." The *idea* seems to be already sold. Right now the real job seems to be to *sell the product*.

But, here's the rub: air conditioning today is a confusion of ideas, of theories, of terms. There is a Babel of voices—forces pulling in all directions—a lack of agreement on plan or purpose. What to call it, how to explain it, what appeals should be emphasized, how to install it, how should it work, what should it do for the buyer? An agreement upon the best answers to such questions would give all sales promotion of air conditioning a direction, a singleness of purpose, and a continuity of educational effect. Air conditioning needs a plan and a program. If it would work as it did for electric refrigeration, who could complain?

Worthwhile Objective Needed

In the case of electric refrigeration the advertising men had an *assignment* from their top executives. They had been entrusted with a sizeable fund, and were conscious of their responsibility to spend it wisely in the interests of all. Thus they had a definite objective, and were under a pressure to see the job through to a successful conclusion.

Obviously the kind of men who can do this sort of job for a whole industry can be brought together to acquire the necessary inspiration only by setting up a worthwhile objective. Given a hundred thousand dollars or more to spend *cooperatively*, it is entirely possible that the promotion minds of the air-conditioning industry could lick the job in short order.

'Catalytic Agent'

If air conditioning is to duplicate the rapid rise of electric refrigeration and ride upward with the next wave of prosperity, then this job of clarifying the aims and purposes, the charting of promotion procedure, should be done without delay. If the idea suggested above appeals to the responsible executives of the industry, ELECTRIC REFRIGERATION NEWS will endeavor to function, as it has on certain occasions in the past, as sort of a "catalytic agent" for the present dissociated elements in the field.

LETTERS

Specifications

Issue Sold Out

Fred'k V. Buchner
51 East Kings Highway
Audubon, N. J.
April 26, 1934.

Editor:

Will you kindly forward 12 complete copies of the refrigerator specifications which you published in the ELECTRIC REFRIGERATION NEWS a short time ago.

The reason I make this request for these copies is due to the fact that the copies you forwarded to me last year were printed on regular letter size paper and our outside selling men found them very useful throughout the entire season in making a fair comparison with a prospect on competitive makes.

Trusting that these specifications for this year are again available and that you will give this your prompt attention.

J. F. BUCHNER.

Answer: Last year we sold out a large supply of extra copies of the Specifications Issue and then ran off a small quantity of press proofs to fill the remaining orders. This year the demand is so great that it will be necessary to do the job on a production basis by including the revised specifications in a regular issue of the News. Look for this data May 30.

We Admit the Obligation

Middleton Electric Co.
514 Ohio St., Sedalia, Mo.
April 21, 1934.

Editor:

In reply to your letter of the 19th beg to advise that the data which we require has been destroyed to a point where it is not possible for us to photostat it. We feel that you have a very definite obligation to the refrigeration industry in regard to supplying this data. You have supplied it every year and this is the first year that you have not been in the position to supply additional copies of specification issues.

We believe that in order to avoid a feeling on the part of the trade that you are trying to merchandise your DIRECTORY, that an additional run of the March 21 issue or repetition of this data in an early issue showing the new prices or the publication of a small booklet giving this household data, might be profitable to you and fill a definite need to the refrigeration industry.

While we feel that you are trying to capitalize the fact that you are the only refrigeration trade paper, it is necessary for us to have this data and we attach our check for \$2.75 and request that you allow us the five lot price on this book.

H. A. MIDDLETON.

Answer: Don't shoot mister, we'll reprint the specifications. Also, we are sending the book, but the price is \$3.00 and you owe us two bits.

We've Thought About That Too

The R & G Furniture Co.
120 Main St., Evansville, Ind.
April 21, 1934.

Editor:

In answer to your letter of April 16 regarding our order for 15 copies of specifications of all makes of electric refrigerators please be advised that we did not want copies of the News itself but thought that you would be putting these specifications in a booklet form just as you did last year.

I am sure that you could sell plenty of these if sold at nominal cost as every refrigeration salesman should carry one in his selling kit provided he is selling a refrigerator that has outstanding features of design and construction.

R. E. CLAWSON,

Manager, appliance department.
Answer: We have considered the idea of a separate book of specifications but it would be necessary to charge about 50 cents per copy. It is the revenue from advertising which makes it possible to sell you the News at 10 cents per copy.

Can You Help This Reader?

63 North Munn Ave.
East Orange, N. J.
April 14, 1934.

Editor:

I have just recently become a subscriber to your very valuable paper, because of my keen interest in air conditioning I am glad to say that I have found your paper of considerable value in helping me to formulate my ground work.

My chief interest is to become a distributor for a concern which is, or which will manufacture equipment for homes, offices, hotels, shops, banks, restaurants, etc. Since the field is so

new to me, and so many are going into the business, I find myself badly confused as to just whom to try to connect with.

Naturally, I want to connect with a company which will be a prime factor in the business; which will make good units, and which will be reasonably sure to satisfy the trade.

Won't you please put yourself in my place, so that you can realize how important it is to get started right, and then think of several concerns with whom you would like to be associated, if you were starting out more or less in the blind, as I am.

I will be more grateful for your advice, than I can express, and shall treat your advice very confidential. I have spent the past eight years with H. M. Byllesby & Co. which is well known in the utility field. I have sold many millions in bonds for them, but the dullness of the financial business is forcing me to make a change.

L. W. PETERSEN.

A Buyer Wants the Specifications

20 Saratoga Street
Springfield, Mass.
April 15, 1934.

Editor:

My husband and I take the Consumers Research and last evening in looking over the issue on electric refrigerators we came across the name of your concern and wondered if it would be possible to get hold of the March 22, 1933 copy of the ELECTRIC REFRIGERATION NEWS which was mentioned there.

We wish to know about the makes, model numbers, sizes, mechanical features, etc., as we can not get that kind of information from the men who sell electric refrigerators.

According to the Consumers Research the copy of ELECTRIC REFRIGERATION NEWS, March 22, 1933 is available for ten cents. Now if this copy is available to private families like myself I shall enclose ten cents in this letter hoping you will send it to me.

If it is possible for me to take a subscription to your magazine will you kindly send me a subscription blank.

MILDRED KRAMER.

Good 'Shots'

The Imperial Brass Mfg. Co.
120 W. Harrison St., Chicago

Editor:

In a recent issue of ELECTRIC REFRIGERATION NEWS I noticed a very modest mention of your taking the pictures shown therein. Would you mind advising me what kind of a camera you used on these "shots," the type of film, etc. I thought they were very good. Please direct reply for personal attention of the writer.

M. MANSFIELD.

Valuable Information

Sam S. Glauber, Inc.
East 79th St., New York City
April 26, 1934.

Editor:

We wish to compliment you on your 1934 REFRIGERATION DIRECTORY. It is without doubt the most complete directory that we have ever received. The information contained therein is very valuable to anyone connected with the refrigeration industry, and we recommend it highly to anybody.

A. S. PENT.

Directory Statistics Are Useful

Pacific Gas and Electric Co.
245 Market St., San Francisco
April 24, 1934.

Editor:

In glancing through the 1934 REFRIGERATION DIRECTORY I became so much interested in it that I have had it carefully reviewed, and the reviewer agrees with me that this is a particularly valuable publication on refrigeration and its allied manufacturers. Its coverage is certainly complete, the statistical value particularly useful, and the review section is quite interesting.

R. E. FISHER,

Vice president in charge of public relations and sales.

The Mail Order Curse

Whalen's Sales and Service
Alamo, Tex.
April 17, 1934.

Editor:

We read the publicity of the Electrolux kero box and took on the dealership, doing a lot of advertising and selling some boxes. Only to find that the honorable Sears Roebuck were underselling us on the same box by about \$80. We believe that this fact should be published in your paper so that other dealers will not get stuck as we did.

We believe that you should use a lot of care in giving the dope on new boxes as most refrigeration dealers are guided entirely by your paper. If they are Sears Roebuck outfits then they should have very little publicity as that outfit certainly does the refrigeration industry no good.

Assuring you that we appreciate your paper.

M. D. WHALEN.

24 Air Conditioners In Kelvinator Line

(Concluded from Page 1, Column 2)
type models having the suffix "DC" in the model number is accomplished by using a solenoid valve operating in conjunction with the humidistat. The same thermostat and humidistat that are employed for summer air conditioning are used for winter air conditioning.

Self-Contained Units

There are six models in Kelvinator's line of self-contained air-conditioning units. Condensing units, cooling coils, fans, fan motors, air filters, and all controls necessary for completely automatic operation are contained in these cabinets.

The SC50DU, SC70DU, and SC100DU have automatic temperature control as provided by a room thermostat. The SC40DC, SC60DC, and SC90DC provide both temperature and humidity control by means of a room thermostat and a room humidistat.

Capacities of the self-contained units range from 1/2 to 2 tons of refrigerating effect per 24 hours.

Top, upper, and lower front panels; upper and lower rear panels; and inlet and outlet grilles are removable in the self-contained cabinets, facilitating installation, adjustment, and inspection.

Heat given off by the condensing unit, which is located in the cabinet's lower compartment, is absorbed by a water-cooled coil. Both compartments are heavily insulated with special sound-absorbing and heat-resisting material.

Forced-convection coils, fans, and fan motor are located in the upper compartment. The fan motor is of the three-speed totally enclosed, quiet-operating capacitor type, and is rubber mounted to minimize noise.

The discharge grille is located in the top of the cabinet. Proper deflection and diffusion of air are provided by specially designed fins.

Floor-Type Units

Seven units make up the Kelvinator floor-type air-conditioner line, ranging in capacity from 1/2 to 2 tons in ice melting equivalent per 24 hours.

The FT50DU, FT70DU, FT100DU, and FT150DU afford automatic temperature control by means of a room thermostat; the FT40DC, FT60DC, and FT80DC, which are used with both a room thermostat and a room humidistat—the latter in conjunction with a solenoid valve—provide both automatic temperature control and automatic humidity control.

The floor-type unit is intended for connection to a remotely located condensing unit, and may be installed either singly or in multiple, with thermostats and humidistats furnished as required. Air filters, fan motors, grilles, panels, and fins incorporate the same features that are found in those used with the self-contained units.

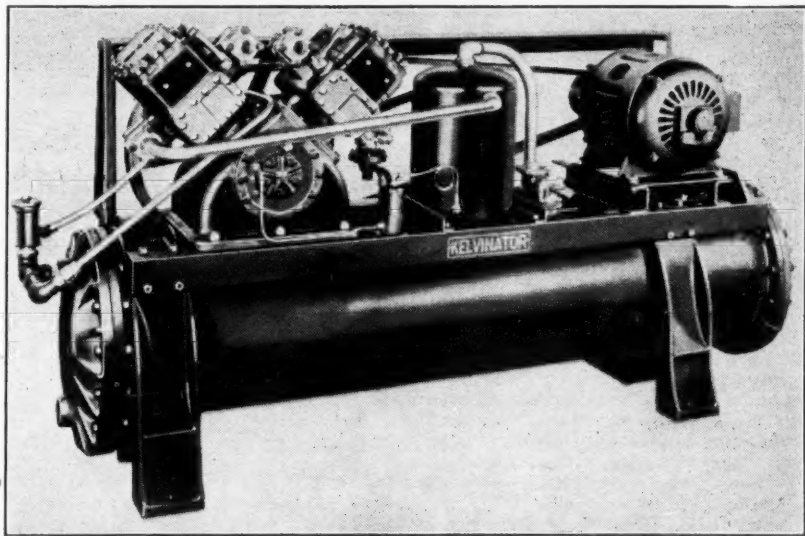
Suspended Units

For use in large offices, funeral parlors, restaurants, stores, duct-system application, and anywhere where floor space is at a premium, Kelvinator provides 11 suspended-type air conditioners.

Seven of these units have thermostat control. They are the C75DU, C150DU, C300DU, CA300DU, CA450DU, CA550DU, and CA700DU.

The CA240DC, CA300DC, CA375DC, and CA450DC models in this series provide both automatic temperature and humidity control, by means of thermostats and humidistats.

For Air Conditioning



New four-cylinder condensing unit, one of several recently announced by Kelvinator particularly for air-conditioning applications.

The suspended types are for connection to a remotely located condensing unit, and may be used in either single or multiple installations. Capacities range from 1/2 to 8 tons in 24-hour ice melting equivalent. Eight of these units (those with "CA" prefixes) may be provided with heating coils and humidifying sprays for winter air conditioning.

Fan motors are belt-driven by single-speed, repulsion-induction motors on all eight models having the prefix "CA." On the remaining three models motors are three-speed.

Air outlets are in front of the unit, and the air filter is located in the inlet opening in the top. Fans are rubber-mounted in all units having prefix "CA."

Thermostats Are Separate

Thermostats and humidistats are not included in either the floor-type or suspended units, but are provided separately according to the requirements of the particular installation.

The Kelvinator line of air conditioners also includes three types of air-conditioning coils for use in duct-type central station systems. The approximate capacities of these coils are 2 1/2, 3 1/2, and 4 1/2 tons in ice melting equivalent per 24 hours.

All coils, whether for cooling, dehumidifying, or heating, are of the continuous tube type. Fins are also continuous.

The coils are specially designed and constructed for forced-air flow. Drainage of the water condensed on the coils while dehumidifying the air is accelerated by special design and arrangement of the coils; the bottom of the fins is saw-toothed; the air flows downward and in the same direction as the condensed water falls by gravity; the air flow is so directed as to assist the condensed water in reaching the drain outlet. Re-evaporation during the "off" cycle is thus minimized.

Counterflow Heat Transfer

The air flows downward and the refrigerant upward, providing counterflow heat transfer.

With the exception of the self-contained units, each air conditioner is equipped with a heat exchanger to increase further the capacity of the condensing unit and prevent condensation on the suction lines under normal conditions.

A step-down transformer may be

obtained to provide low voltage (20 volts) current for the control circuits on all alternating current units. This low voltage simplifies installation and minimizes shock and fire hazards. A transformer is included with all alternating current self-contained and floor-type units.

Turbine Furnishes Well Water for Cooling Condensers

RICHMOND, Ind. — Shallow well water systems for supplying condensation water for water-cooled condensing units have been introduced by the Richmond Turbine Pump Co., Inc., of this city, manufacturer of shallow well systems and brine pumps.

The unit for operation with commercial water-cooled refrigerating machines consists of a 300-gal. per hour fully automatic shallow well system equipped with a 10-gal. tank. A water regulating valve is connected to the tank and set to operate at 100 lbs. head pressure for methyl chloride or 75 lbs. for sulphur dioxide.

A ball check valve is connected in front of the water regulating valve to prevent city water from being backed into the line and run into the well.

Where the well will deliver a supply of water which at all times is adequate for condensation purposes, the ball check may be omitted.

If the user desires to make a connection to the city water supply to supplement the well supply, a "T" connection is placed in the line. Below the "T" is another ball check valve, and below the ball check valve is a second water regulating valve which is set to operate at 110 lbs. head pressure for methyl chloride or 85 lbs. for sulphur dioxide.

If the supply of water from the well is limited and space is available, arrangements may be made for aerating the water and using it over. This, however, is not recommended where the well supply is adequate for condensing purposes, as the water taken directly from the well is usually at a lower temperature than aerated water.

It is claimed that installation of the shallow well systems effects considerable savings not only with respect to the cost of water consumed from the city water supply, but also in the power bill, due to lower condensation temperatures which the well water makes possible.

Officials of the Richmond Turbine Pump Co., Inc., cite the installation at Smith & Sons' market in Richmond as an example. Equipment in this market consists of a 1/2-hp. water-cooled Frigidaire unit which handles a 12-ft. display case, and a 1-hp. Frigidaire unit which supplies refrigeration for a 10x10-ft. walk-in cooler.

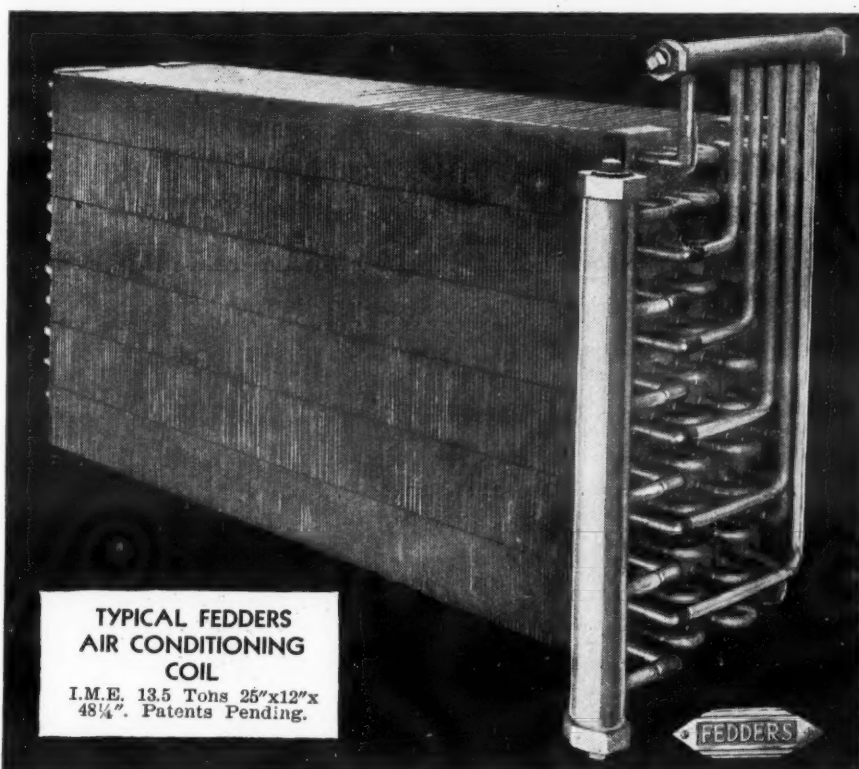
Smith & Sons' quarterly water bill was formerly \$35 to \$45. Since the installation of the shallow well system, the water bill has been reduced to \$3 (the minimum) per quarter, since city water is used for drinking purposes only. The electric power bill has been cut an average of \$10 per month, Mr. Smith declares.

Florsheim Shoe Stores To Be Conditioned

NEWARK—Several retail stores of the Florsheim Shoe Co. are to be equipped with Carrier air conditioning this summer, according to J. A. Carey and O. M. Ragsdale, who are in charge of Carrier's chain store program. Installations are scheduled at Houston, Fort Worth, Dallas, and Chicago. First installation in a Florsheim store was made by Carrier last year in New York City.

Announcing a COMPLETE LINE OF FEDDERS

Time Tested HEATING AND COOLING COILS for AIR CONDITIONING



TYPICAL FEDDERS AIR CONDITIONING COIL
I.M.E. 13.5 Tons 25"x12"x 48 1/4". Patents Pending.

FOR ALL TONNAGE REQUIREMENTS

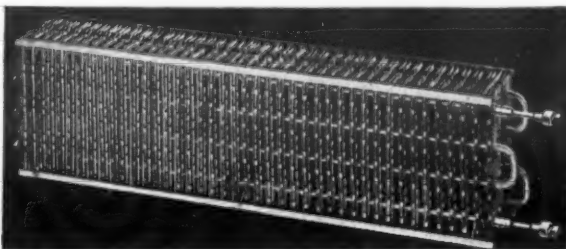
Refrigeration and air conditioning engineers are now offered a complete line of Fedders Coils to meet the exacting requirements of air conditioning installations.

Fedders Air Conditioning Coils are available for all tonnage requirements. They are made with either flat or corrugated copper fins BONDED to copper tubes. The Fedders Metal-to-Metal Bond between copper fins and copper tubes maintains lifelong efficiency of the coils, which in turn, assures continued operating efficiency and current economy of the condensing unit. Fedders Air Conditioning Coils are made for use with all standard refrigerants.

Fedders Air Conditioning Coils have been adopted by the world's foremost manufacturers for room cooling in homes, offices, buildings, stores and railroad cars. They have met every test of time and service.

FULL ENGINEERING COOPERATION
Fedders Engineering Service is at your command. Mail your prints or complete data on your requirements for prompt recommendations and prices on necessary coil sizes.

QUICK DELIVERIES ON ALL SIZES



FEDDERS NON-FROST COMMERCIAL EVAPORATORS

Sizes and capacities to meet every installation problem. Copper Fins fused to Copper Tubes for lifelong efficiency. Pat. 1,869,174.

HOW FEDDERS FORCEDRAFT UNIT COOLERS MAINTAIN CORRECT RELATIVE HUMIDITY

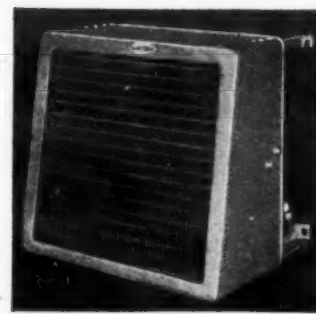
Hundreds of integral water troughs are provided by the Fedders exclusive Inclined Element. They provide air conditioned refrigeration with Forced-draft circulation in all parts of the box. Send for Bulletin 66 describing the complete line.

FEDDERS MANUFACTURING CO.

57 Tonawanda St., Buffalo, N.Y.

300 Fourth Ave., New York
923 E. Third St., Los Angeles
603 W. Washington Blvd., Chicago
222 E. Ninth St., Cincinnati
209 S. Pearl St., Dallas

Are You Getting Your Copy of the Fedders News?



Pat. Pending.

ALL BRASS AND COPPER, NO RUST

Fedders Unit Coolers CAN NOT RUST. Even the bolts and nuts are Brass.

New Kelvinator Design



Floor-type air-conditioning cabinet, a unit in the complete line just announced by Kelvinator. See description above.

Detroit Lubricator Announces New Valve For Heavy Duty Air Conditioning

(Concluded from Page 1, Column 2)
put out for field tests were rated at six tons capacity. Several minor changes were then made to eliminate restrictions in the flow passageways which greatly increased the capacity. Capacities as high as 14 tons on air-conditioning pressures have been reported with the new valve, but the company is offering a rating of eight tons for Freon refrigerant at air-conditioning pressures. For higher head pressures and lower suction pressures the capacity is considerably higher. Higher capacities are obtained with the valve on methyl chloride.

Standard outlet connection on the new valve is provided for one-inch pipe, a smaller size pipe tap being available on request. Stream line fittings will also be sweated in at the factory on special order.

Standard inlet connection will be 1/2-in. flare tube. Smaller flare tube connection will be supplied on request or pipe tap connection can be supplied up to 3/4 in.

The No. 785 valve will be supplied with gas pressure charge in the power element. This principle limits the

maximum operating pressure of the valve in order to protect the motor against overload. The new valve can be used on any refrigerant non-injurious to brass.

Engineering Details

By D. D. Wile, Detroit Lubricator Co.

The new No. 785 "Genuine Detroit" thermostatic valve operates on the same principle as the No. 673 and No. 674 thermostatic expansion valves familiar to the industry. A new design is used to accomplish features desirable in a large size valve. Special attention has been given to rugged construction, durability, and accessibility of parts.

Referring to Fig. 2, the body bellows "G" responds to low-side pressure and actuates the needle "J" by means of a stainless steel push pin "I." The needle is forced toward the seat by means of a stainless steel spring "M" which is provided with an adjustment "Q."

The thermostatic bulb "A" is connected to the power element "B" by

a capillary tube. The temperature at the bulb transmits pressure to the power element bellows "C." This bellows is coupled directly to the body bellows by a stainless steel tie rod "E."

In the operation of the valve, the two bellows work against each other through the tie rod so that the needle opens only when the pressure in the power element exceeds the evaporation pressure. By this means the valve admits just enough refrigerant to the evaporator to maintain the bulb "A" at a specified superheat. When bulb "A" is clamped to the suction line the valve simply keeps the evaporator completely refrigerated.

Stainless Steel and Delubaloy Used

Throughout the construction of the valve, stainless steel has been used for all parts subject to stress and rusting or corrosive action. These parts include the tie rod "E," push pin "I," seat holder and needle shank, spring "M" and adjusting stem "Q."

The needle and seat are tipped with "Delubaloy." This is a new material, the result of several years search for a material that would withstand the action of corrosive elements found in SO₂, Freon, and methyl chloride systems, especially when moisture is present and corrosive drying agents are used.

The inlet connection "K" is a heavy brass forging and carries a copious strainer "L." The strainer is easily removed for cleaning or replacement.

By removing the forged brass nut "N" the entire needle and seat assembly is made accessible for inspection and cleaning. This can usually be done without removing the valve from the system.

A unique principle is employed in the needle assembly to eliminate any possibility of side thrust or misalignment. The needle is provided with a spherical shaped base.

The push pin "I" engages at the center of the sphere, allowing the needle to assume exact alignment with the seat. It is then held firmly in position by the pressure of the spherical surface against the cone shaped cup in the spring carrier. When the valve is taken apart and then reassembled, the needle automatically aligns itself exactly with the seat without any possibility of side thrust.

Adjustment of Valve

Adjustment of the valve is made by removing the cap "O" and turning the stem "Q" using a standard shut-off valve ratchet wrench. In addition to the seal cap "O," a dependable stuffing box is provided around the adjusting stem. The adjusting stem is of the non-rising type. A left-hand thread is used so that turning the stem clockwise tends to close the valve.

Each valve is adjusted at the factory to maintain the proper superheat. Readjustment is seldom necessary except in exceptional cases.

Fig. 3 shows a typical superheat curve obtained from the valve. Note that practically constant superheat is maintained at the valve over a wide range of suction pressure. When adjustment is necessary the adjusting stem should be turned clockwise to decrease the flow of refrigerant, or counter-clockwise to admit more refrigerant.

Gas Charging Used

The valves will have the power elements charged with gas at definite pressure instead of liquid. By this means the valve remains tightly closed whenever the suction pressure rises above a specified point, regardless of the temperature of the thermostatic bulb. This prevents overloading of the motor when starting up a warm system or when operating under excessive temperature conditions.

After the suction pressure has been reduced below the maximum operating point, the valve opens and admits sufficient refrigerant to refrigerate the evaporator completely without permitting liquid to enter the suction line.

The specified maximum pressure settings are determined when the power element is charged at the factory. When the maximum operating pressure is selected above the normal cut-in point of the pressure control, the valve will always function to maintain maximum efficiency at the evaporator.

The maximum operating pressure should be specified high enough to be above the normal operating pressure of the system. For convenience and quick delivery standard maximum operating pressures have been adopted as follows: 60 lbs. for Freon, 50 lbs. for methyl chloride and 35 lbs. for SO₂. Other maximum pressures can be supplied on order.

Steam Jet Refrigeration Discussed in Chicago

CHICAGO—"Steam Jet Refrigeration" was the subject scheduled to be discussed at the May 1 meeting of the Chicago section of the American Society of Refrigerating Engineers. E. F. Miller, engineering department, South Philadelphia Works, Westinghouse Electric & Mfg. Co., was to be the speaker at the meeting.

8-Ton Thermostatic Expansion Valve

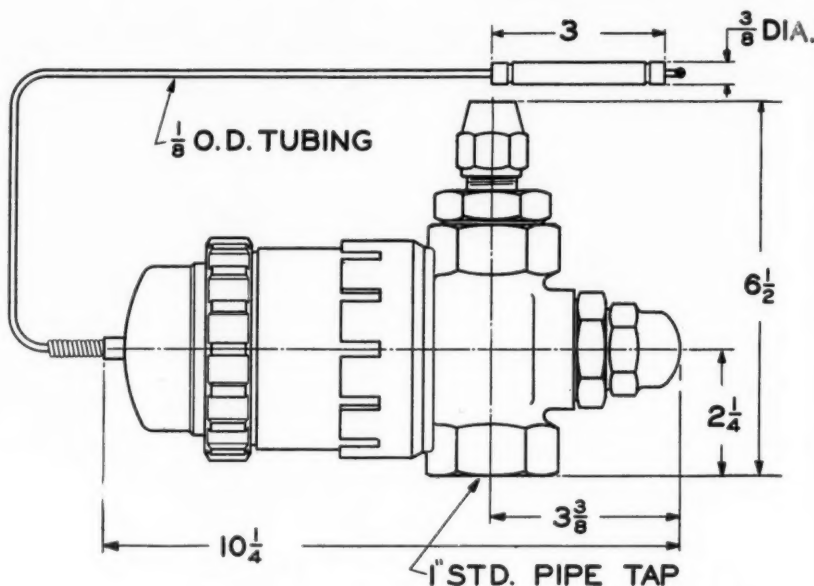


Fig. 1. Dimensions of the new Detroit valve for air conditioning.

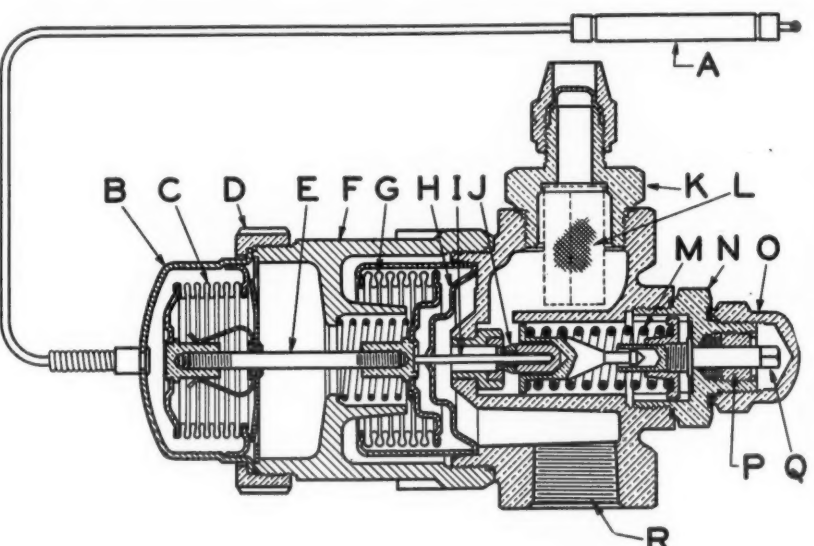


Fig. 2. Section of Detroit Lubricator's new 8-ton thermostatic expansion valve: A—Thermostatic bulb. B—Thermostatic power element. C—Power element bellows. D—Hold down nut. E—Stainless steel tie rod. F—Bakelite extension. G—Body bellows. H—Baffle plate. I—Stainless steel push rod. J—"Delubaloy" needle & seat. K—Inlet connection. L—Removable strainer. M—Stainless steel spring. N—Removable body plug. O—Adjustment seal. P—Stuffing nut. Q—Adjusting stem. R—Outlet connection.

Superheat Curve

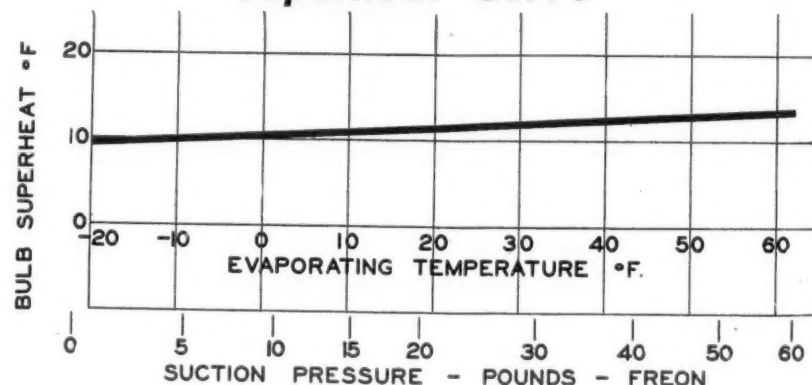
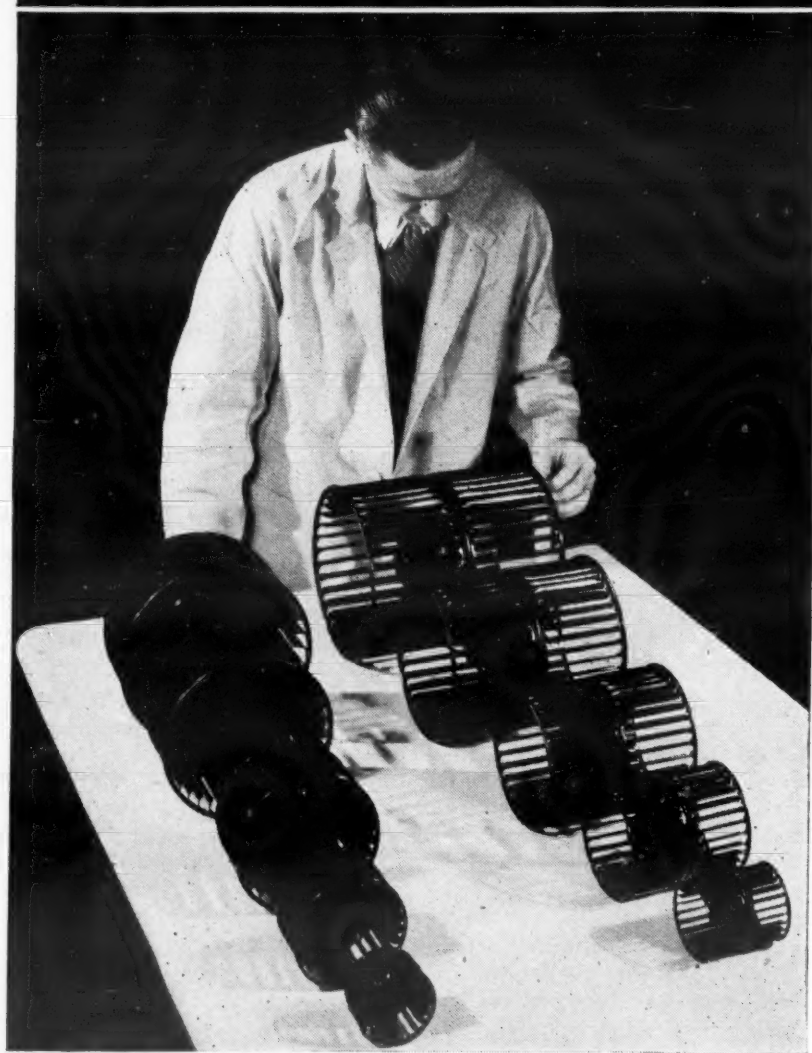


Fig. 3. Practically constant superheat over a wider range of suction pressures is obtained with the new Detroit thermostatic expansion valve.

PRESSED STEEL WHEELS For Oil Burners, Driers and Air Conditioning Units



Immediate Delivery at Production Prices!

● A wide variety of combinations and types of multi-blade wheels—ranging from three inches to nine inches in diameter, with standard and reverse hubs, for clockwise or counter clockwise operation, in single and double widths—are carried in stock for immediate delivery.

Over fifty years' experience, quantity production methods and the finest equipment for the manu-

facture of multi-blade wheels for air handling enables us to produce these precision made wheels at unusually attractive prices.

You are invited to correspond with us regarding capacities, sizes, prices, etc. of wheels for oil burners, air conditioning units, driers, etc. There is no obligation. Address your inquiry to — Appliance Accessory Department.

AMERICAN BLOWER CORPORATION
Division of American Radiator & Standard Sanitary Corporation
6000 Russell Street Detroit, Michigan

American Blower
VENTILATING, HEATING, AIR-CONDITIONING, DRYING, MECHANICAL DRAFT
DIVISION OF AMERICAN RADIATOR AND STANDARD SANITARY CORP.

Please send data on wheels for—

Name _____

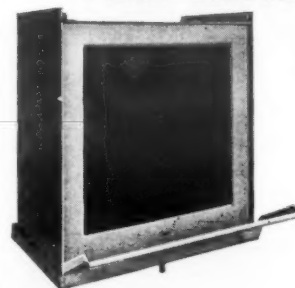
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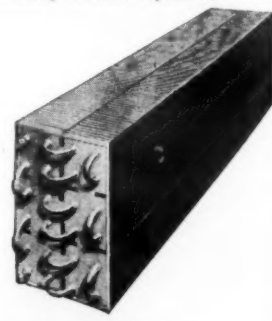
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Kramer Turbofin Unit Coolers

Coil construction all copper hot dipped. Shell construction all brass finished in dark green Dulux. Made in 5 sizes, 20 to 80 lb. hourly I.M.E. capacities.



Kramer Commercial Evaporators

All copper hot tinned construction, or copper fin steel tube for ammonia systems. Also all steel hot galvanized for ammonia. Made in 10 different fin sizes—various fin spacings—to any over all dimensions, and to required capacities.

Turbofin Unit Coolers
Commercial Evaporators
Domestic Evaporators
Condensers

Bottled Beer Cooling Coils
Ice Cube Makers
Shelf Evaporators
KX Case Evaporators
Junior KX Case Evaporators

TRENTON AUTO RADIATOR WORKS

Main Offices and Factory, TRENTON, NEW JERSEY
NEW YORK, 241 West 68th Street PITTSBURGH, 5145 Liberty Avenue

AIR-CONDITIONING MERCHANDISING

Air Conditioning Market Ready for Big Year, According to Field Surveys

By S. F. Myers, General Supervisor of Air-Conditioning Dealers
Westinghouse Electric & Mfg. Co.

If there was ever a business that requires field studies and market analyses the air-conditioning business does. From a study made last fall, the Westinghouse advertising and sales promotion plans were devised. Our engineering developments, too, were guided to a certain degree on the findings of this survey. For example, last year we did not have a half-ton ceiling-type

air-conditioning unit in the line, but from the surveys made by dealers we were convinced this type of unit was in demand.

The market also demanded a small compact self-contained unit having a capacity of from one-half to one ton and in size not to exceed 38 in. long, 25 in. high, and 13 in. deep. This definite conclusive survey convinced us beyond the shadow of a doubt that these two items as well as others had to be added to the line in order to put our dealers on a competitive basis.

This business will be benefited by a careful analysis of the air-conditioning dealers' actual surveys. This method brings the local situation right into headquarters and in most activities where a manufacturer distributes through dealers, their local activities and possibilities are so removed from the mahogany desks that too often the dealers protests and suggestions become a mere whisper from somewhere away off in the distance.

50% Sales Increase Expected

From the individual comments from our dealers, the average indicates a 50% increase in sales compared with 1933, and a 75% increase in actual requests from local business establishments for surveys and estimates for their offices and business establishments.

Our advertising department reports a larger increase in inquiries from our national advertising. The Commonwealth Edison Co. of Chicago announced on March 31 that the 1934 per cent increase over the same period of 1933 in number of installations is 460%, and that the 1934 increase in electric horsepower installed was 360%.

This is going to be a fast-moving business which means the manufacturers must have stocks in most metropolitan centers now, because when a purchaser of air-conditioning equipment places his order he expects the installation to be started the same day, not the next.

Class of Prospects

From our 1933 sales reports, the percentage figures given in the attached chart show what class of

Westinghouse Air-Conditioning Sales in 1933

Type of Installation	Per Cent of Total Installations
Banks	3.2
Brokerage Houses	8.0
Candy Shops	4.75
Cold Storage	3.2
Dress Shops	4.75
Drug Stores	3.0
Funeral Parlors	1.6
Men's Furnishings	1.6
Offices	38.0
Residences	17.5
Retail Stores, Miscellaneous	8.0
Restaurants	6.4
Total	100.0

user purchased commercial unit air-conditioning equipment.

This kind of information assists greatly in the preparation and selection of national business and trade paper advertising as well as direct mail and sales promotion material.

Dealer Organization

The manufacturers of complete all-year air-conditioning equipment whose line of equipment permits them to insert the following statement in their advertisements has a very wide range of outlets to choose from to represent them and do a real sales, engineering, installation, and service job:

"True air conditioning performs all of these six functions: (1) Refrigerates the air when it is too hot, (2) Warms the air when it is too cool, (3) Humidifies the air when it is too dry, (4) Dehumidifies the air when it is too moist, (5) Cleans and filters the air, and (6) Circulates the air. You can obtain this equipment that performs all these functions or combinations of them as may be desired."

Building specialty dealers, heating, ventilating and plumbing houses, elec-

Sees Big Market



S. F. "SHEL" MYERS

trical contractors, established dealers in refrigeration, all of these may find they have opportunities to make air-conditioning sales but to each and every one of these organizations must be added adequate sales, engineering, installation, and intelligent servicing organizations.

However, local participation in the air-conditioning field will by no means go to these established outlets alone. Several of the major manufacturers of air-conditioning equipment are not selecting their dealers from any single class of experience, but are much more concerned with whether the organization desirous of a dealership is a sound businessman with sufficient working capital to operate effectively, having proper ethical standards, and with the necessary ability to organize an aggressive selling organization.

Again, it must be repeated that existing organizations such as those mentioned above must supplement their own sales ability with the technical ability of trained air-conditioning engineers. Each air-conditioning installation must be well planned and receive a certain amount of engineering advice in order that the apparatus will operate entirely to the user's satisfaction.

Extreme care on the part of the manufacturer must be used in the selection of dealers, since air conditioning is comparatively new and requires specialized sales and engineering facilities, together with the knowledge of building construction, plumbing, heating, and local trade regulations.

The larger manufacturers of air conditioning are providing training courses for air-conditioning dealers in all of the different phases of engineering, installation and servicing, as well as in proper sales approach.

The dealers also must be taught how to estimate the requirements of a job and to interpret their requirements accurately and intelligently in terms of the number and type of condensing units and cabinets best suited to meet the situation.

Pride of Ownership

If anyone reading this article doubts the author's word that any business man, restaurant proprietor, or funeral director who has had a year's experience with air conditioning is sold on it and would have it installed again if he were to move to new and larger quarters, it is suggested that you ask the owner some of the questions listed in the accompanying questionnaire.

Utility Companies' Cooperation

The air-conditioning business is receiving splendid cooperation on the part of most electric utilities, the reason being obvious. One utility in the southwestern part of the country is devoting several of its large 24-sheet illuminated outdoor advertising boards to air conditioning. The first

in a series of these of three different copy layouts reads:

1. "Air conditioning increases business."
2. "Turn off the heat. Turn on the cold. Install air conditioning for comfort in all temperatures."
3. "Turn on the cold. Air conditioning for summer comfort."

The air-conditioning industry in general is headed, and has a flying start to be, one of the country's leading industries.

This business must pass through four stages of development: (1) Development, (2) Pioneering, (3) Expansion, and (4) Replacement. Right now we are between the first and second stages, Development and Pioneering, but "don't wait for a greener green light!"

Air Conditioning Questionnaire

1. Name of firm. Address.
2. Nature of business. How long has it been established?
3. How long has your equipment been in operation?
4. Approximate number of days operated last year?
5. Does the equipment keep your place of business comfortable in extremely hot weather?
6. Do you notice an improvement in the cleanliness of your place of business?
7. Description of air-conditioning installation:
 - A. Source of cooling. Mechanical. Steam Jet. Size, tons.
 - B. Number and type of units.
 - C. Air distribution—duct. Unit air conditioner. Combination of both.
 - D. If unit type, number and type of units. Finish.
8. Sketch of layout.
9. Do you think that the initial cost of your air-conditioning installation is in line with what it has accomplished so far?
10. If it has been a self-liquidating proposition for you? Explain why.

11. What do you think of the operating cost of your installation?
12. Give either actual or average costs for operating air-conditioning equipment only.
 - A. Monthly cost of electricity.
 - B. Monthly cost of water.
13. Since you have installed air conditioning in your place of business, what changes have you noticed in the attitude of the customers, in their buying habits, length of time they stay, and the number of times they visit you?
 - A. If a restaurant, do your patrons eat more and are your employees more courteous and more alert?
 - B. If a dress shop, is there a reduction in number of dresses soiled as a result of try-ons? Do they linger longer to look around?
 - C. If an office, do you have less difficulty with vacation schedules, etc?
14. Does it increase the efficiency of your employees?
15. Does it decrease your labor turnover?
16. What do your employees say about the conditions under which they now serve you and your customers? (Ask one or two of them now.)
17. How much has it increased your business? Give percentage increase for a season with air conditioning over the previous season without air conditioning, or for individual months with air conditioning over same months for previous year without air conditioning. State for which periods comparisons are given.
 - A—Percentage increase of gross dollar volume of business.
 - B—Increase in number of people entering your place of business.
 - C—Increase in average size of check or purchase.
 - D—Other evidences of increased business.
18. What prompted you to investigate the possible cost, etc., of air conditioning your?
19. Reason for installing air conditioning?
20. Do you believe summer air conditioning will be necessary to the successful operation of your business in the future?
21. Would you install air conditioning in your place of business were you to move to another location?
 - A. Summer air conditioning.
 - B. Year round air conditioning.
 - C. Why?
22. Are you satisfied that your installa-

- tion is giving adequate and satisfactory results or do you think that further improvements are necessary for satisfactory service?
23. Has air conditioning ever influenced your own shopping, eating, or movie-going habit?
24. As a direct result of your installation has anyone else in your neighborhood put in an installation? Give the reason.
25. Have your customers' comments been favorable?
26. Signed.
 - A. Title.
 - B. Name of Firm.
 - C. Street.
 - D. City and State.
27. Air-Conditioning Dealer.
 - A. Street.
 - B. City and State.
28. Additional Information.

Detroit Edison Mailing Promotional Piece

DETROIT—Now in preparation is an eight-page mailing piece which the Detroit Edison Co. will send to 17,000 customers believed to be prospects for air-conditioning equipment, according to Sterling S. Sanford of the power sales department. The utility is also using newspaper advertising to aid Detroit sales outlets in cultivating prospects.

California Refrigerator Co. Holds Accessory Show

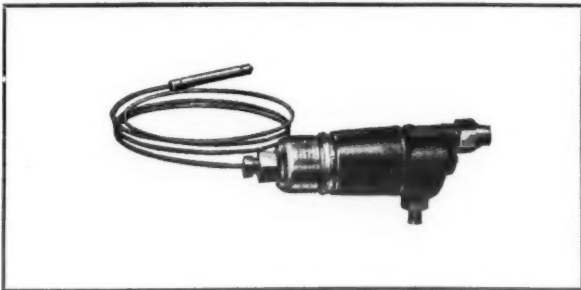
SAN FRANCISCO—California Refrigerator Co. the past week has been holding showings of accessories, parts, and supplies for all makes of electric refrigerators in various California cities.

The more than 500 items were shown to dealers, servicemen, salesmen in Modesto, April 23; in Merced, April 24; in Fresno, April 26, 27, and 28; in Visalia, April 30; in Bakersfield, May 2 and 3.

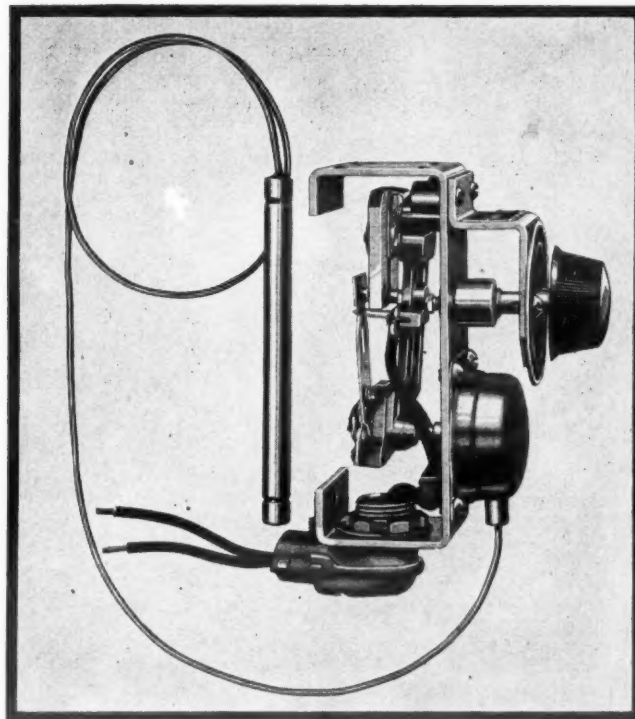
Air Conditioning

needs accurate, dependable

"GENUINE DETROIT" CONTROLS



No. 673 THERMOSTATIC EXPANSION VALVE: Extremely sensitive and efficient. Sealed against moisture. Thermostatic power element gives it automatic operation.



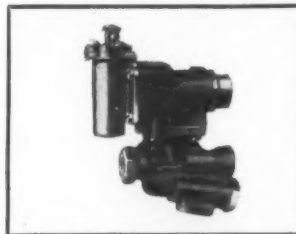
No. 261 CABINET CONTROL: High Voltage. A new thermostat designed to be concealed in the cabinet of room cooler or electric space heater. The thermal bulb is placed in the incoming air, and the thermostat attached inside the cabinet, with knob and dial projecting.



No. 697 HUMIDISTAT: Low Voltage. Accurately regulates moisture content of air. Used with heating units, in conjunction with Solenoid or Electric Water Valve opposite.



No. 244 FURNACE FAN CONTROL SWITCH: High Voltage. Makes circuit on temperature advance. Available also (246) with long stem providing extension in furnace burner from 3 1/2" to 14 1/2".



No. 644 ELECTRIC WATER VALVE: Low Voltage. Quiet in operation. Positive. Closes gradually to prevent hammering or jolting in the line. Integral screen permits cleaning without breaking water line.



No. 250 CONTROL SWITCH: High Voltage. Furnished in various models for control of temperature, pressure or vacuum. Single or double throw. Easily installed. Quickly connected.

THERE are accurate, dependable, low-priced "Genuine Detroit" controls ready for any air conditioning requirement. Easily installed and simple to adjust, they should be included in every installation that you make, to insure accurate, dependable performance. "Genuine Detroit" controls are the accepted standard of many manufacturers. Write today for specifications and details of any control illustrated, or of any other type of control in which you are interested.

DETROIT LUBRICATOR COMPANY
DETROIT, MICH., U. S. A.

CANADIAN REPRESENTATIVE: RAILWAY & ENGINEERING SPECIALTIES, LTD., MONTREAL, TORONTO AND WINNIPEG

• YOUR UNIT DESERVES "GENUINE DETROIT" CONTROLS •

Newell Names Air Conditioning Heads

DAYTON—Expansion of the air-conditioning activities of Frigidaire Corp., subsidiary of General Motors Corp., has been announced by H. W. Newell, vice president in charge of sales, with the appointment of four men to key positions in Frigidaire's national organization.

J. J. Nance, long a member of Frigidaire's headquarters staff and for the last few years manager of the sales planning division, has been named manager of a newly formed air-conditioning division.

J. C. Chambers, member of Frigidaire's field organization since 1919 and for the last two years sales manager for air-conditioning products, becomes sales manager of the air-conditioning division.

L. E. Smith, well known as the head of Frigidaire's sales engineering and refrigeration application division, has been named manager of a section devoting its attention to sales engineering and application of air-conditioning products.

Frank C. Lyons, for many years associated with Frigidaire's central office and one-time branch manager at Washington, D. C., becomes director of air-conditioning education.

Explains Plans

In announcing the appointments and the expansion of Frigidaire's activities in this field Mr. Newell said:

"Two years ago, we actively went into the field with a limited line of air-conditioning products to prove our laboratory findings. Our activity during this two-year period convinced us that once business finally began to pick up and the future was more certain, we could begin to progress on the course previously charted for engineering and sales activity.

"To start our own field organization off on the right foot, so that its members may transmit to the public a definition of air conditioning, here is what we have decided upon:

"True air conditioning performs all of these six functions: 1. Refrigerates the air, when too warm. 2. Warms the air, when too cool. 3. Humidifies the air, when too dry. 4. Dehumidifies the air, when too moist. 5. Cleans and filters the air. 6. Circulates the air."



the world's finest

If it should be your privilege to ride on this world famous Union Pacific Train, we hope that it will be on a hot, humid day, because you will then appreciate fully the supreme comfort of its conditioned air and marvel at the performance of the Lipman Refrigeration System which makes such comfort possible. Nor is this train the only one on which you can enjoy the comforts of Lipman Refrigeration, since it is but one of several hundred Railway installations—many more than all other makes combined.

The ability of the Lipman to meet perfectly the rigid requirements of railway air conditioning (the most difficult of refrigeration jobs) is convincing assurance of its ability to handle ordinary commercial installations with that added degree of efficiency characteristic of a truly advanced product. When quality is accurately measured by a performance yardstick, the Lipman takes first rank.

Domestic and Export Dealer and Consumer Inquiries Welcome.

General Refrigeration Sales Co.
Beloit, Wisconsin

Frigidaire Air-Conditioning Sales Executives



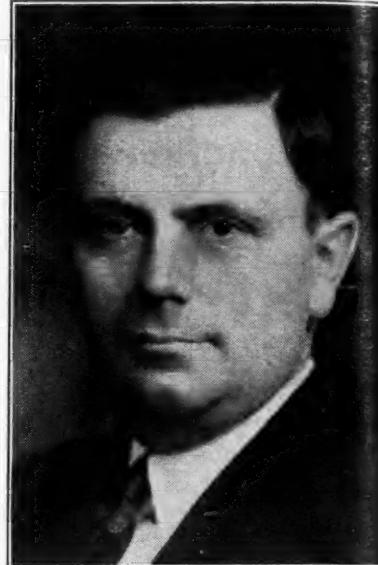
J. J. NANCE



J. C. CHAMBERS



L. E. SMITH



F. C. LYONS

Audiffren Issues New Air Conditioning Book For Executives

PROVIDENCE, R. I.—Written for the "head men" of large offices, department stores, etc. is a non-technical booklet, "Air That Pays," in which the Audiffren Refrigerating Sales Co. tells how air conditioning can step up comfort and profits, and what types of equipment the company has to offer.

First comes a simple description of how the human body reacts to various air conditions; next, a discussion of air properties, in which the importance of proper humidity is emphasized, and the statement made that Audiffren gives first attention to humidity control.

One page is devoted to a picture presentation of the "Audiversal" (Audiffren-Universal) line of air-conditioning equipment. Last part of the booklet, which is printed and illustrated in two colors, gives a step-by-step exposition of how a complete air-conditioning system operates during the course of a day.

Nance Says Comfort Is New Sales Appeal

DAYTON—A new factor, "comfort appeal," is joining "eye appeal" and "mind appeal" as the recognized principal factors in the merchandising of goods, it is pointed out by J. J. Nance, manager, air-conditioning division, Frigidaire Corp.

Through its application in many lines of business, "comfort appeal"—through air conditioning—has demonstrated an ability not only to hold and increase business, but it is fast approaching the enviable place where the business that does not utilize it will soon be at a distinct disadvantage in its competition with air-conditioned establishments, Mr. Nance states.

"The establishment that isn't air conditioned is finding itself in the position of the theater that persisted in showing silent motion pictures once the cinema-going public became accustomed to the talking picture," Frigidaire's air-conditioning manager declares.

"In the motion picture business, the progressive operator who installed 'sound' equipment soon found his house packed. He 'cashed in' on this new development. Long lines of waiting patrons formed in front of his box office.

"The cautious operator thought too long about the cost. Eventually he followed suit, but he paid the same price for equipment and at the same time he failed to realize from 'getting aboard' while this meant increased business. When he d'd get aboard, his business came back, but he invested his funds in order to recapture the business, while the business he lost paid the bill for his competitor's.

"The same thing is being found true about air conditioning. The restaurant that has air conditioning is benefiting by the rush of trade that is seeking a comfortable place of eating. Customers are eating more, too, because it is a scientific fact that when one is cool and comfortable his appetite is stimulated.

"The fur shop that has installed air conditioning is selling its furs in the warm months to people who feel like buying due to the coolness of the surroundings and who are eager to take advantage of bargains that can be offered during the 'off' season."

A survey made in the Chicago metropolitan area shows that business is moving to take advantage of the benefits derived from air conditioning.

According to Mr. Nance, these figures show that prior to 1933 there were 237 air-conditioning installations in Chicago. In the year 1933 a total of 135 installations was made, not including those at A Century of Progress Exposition.

Chicago Air Conditioning Show Opens May 7

CHICAGO—Annual air-conditioning show sponsored by the Commonwealth Edison Co. will open May 7 in the electric shop on the first floor of the Edison building here, according to G. A. Freeman, air-conditioning specialist for the utility. There will be about 10 exhibitors of small equipment.

Sales of air conditioning in Chicago, says Mr. Freeman, have shown a marked increase over last year. To the middle of April, installations—in both number and tonnage—were four times ahead of the corresponding period in 1933.

The company is conducting a newspaper advertising campaign on air conditioning, and is supplying to active sales outlets names of prospects secured through its own direct-mail and personal solicitation efforts.

There will be a number of new air-conditioning installations at A Century of Progress this summer, according to Mr. Freeman. Frigidaire will have a model air-conditioned house, and a system in a new theater erected for the Electrical exhibit.

G-E Sells Air Conditioning Through Dealers

NEW YORK CITY — Sales of all General Electric air-conditioning equipment is made through authorized exclusive air-conditioning dealers in the major cities of the United States, in accordance with the organization set up by the G-E air-conditioning department.

Coverage of smaller towns adjacent to the main outlet is obtained through associate dealers enfranchised by the main dealer. Each of the main dealers has a sales organization for covering the residential territories for all General Electric air conditioners.

For selling air-conditioning in the commercial areas, sales engineers are employed who are trained to make their own heat gain calculations, specify equipment and make up the proposal.

The proposal is then checked by the dealer's engineering department which also supervises the installation of all equipment and acts as a "court of last resort" in all engineering problems, both residential and commercial.

3,000 Installations Made By Carrier

NEWARK — Approximately 3,000 original installations of air-conditioning equipment have been made by the Carrier Engineering Corp.

These figures do not take into account cases where more than one sale has been made to the same customer, nor do they include straight commercial or industrial refrigeration jobs or installations of industrial unit heaters.

Oklahoma Gas Opens Promotional Campaign

OKLAHOMA CITY—Under the direction of Earl W. Gray, the Oklahoma Gas & Electric Co., with headquarters here, on April 1 opened a promotional campaign on air conditioning which embraces demonstrations, free engineering service, personal contact work, and an advertising program.

All of these activities are being conducted to aid air-conditioning dealers in the utility's territory, as the company itself does no merchandising. Plans for the '34 drive were drawn up by the commercial, sales development, and home service departments.

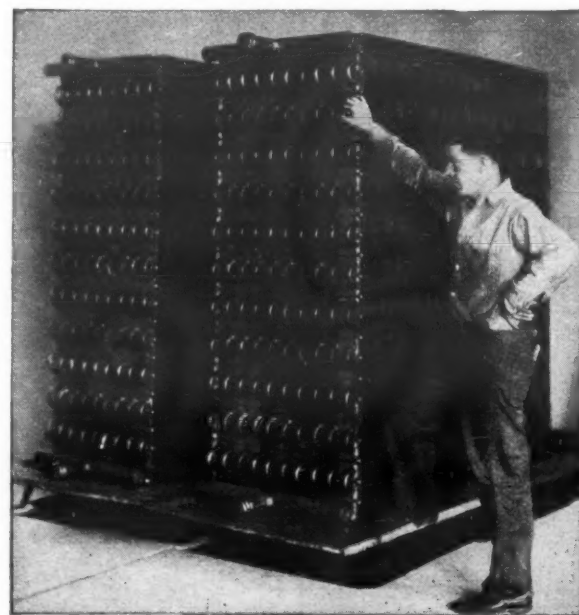
Scheduled to run in 35 daily newspapers during the campaign are eight pieces of copy, while another eight advertisements will appear in 135 weekly publications. Outdoor bulletins and poster panels have been placed in branches of the utility.

Early last month, direct-mail pieces went to a number of the company's customers, featuring advantages of air conditioning. A second mailing, carrying particulars on recent installations, was scheduled to go out yesterday, May 1, to a selected list of prospects.

G-E Dealer Takes Air Conditioners to Homes

SAN FRANCISCO—Electric Appliances, Inc., G-E air-conditioning distributor here, is using a trailer to transport air conditioners to prospects' homes for demonstration. The equipment consists of a heavy wood case mounted on two auto wheels.

AIR CONDITIONING INSTALLATIONS OFTEN REQUIRE SPECIAL FIN COILS TO FIT THE JOB AND BUSH IS IDEALLY SET UP TO TAKE CARE OF SUCH REQUIREMENTS PROMPTLY AND ECONOMICALLY. THE COILS SHOWN WERE USED WITH AMMONIA BUT CAN BE MADE IN ANY SIZE FOR USE WITH ANY REFRIGERANT.



WHEN YOU ARE IN THE MARKET FOR LOW SIDE EQUIPMENT WE WOULD APPRECIATE THE OPPORTUNITY TO QUOTE.

THE BUSH MFG. CO.
HARTFORD, CONN.

41 E. 42nd ST.
NEW YORK CITY

610 N. OAKLEY BLVD.
CHICAGO

Heat Exchanger

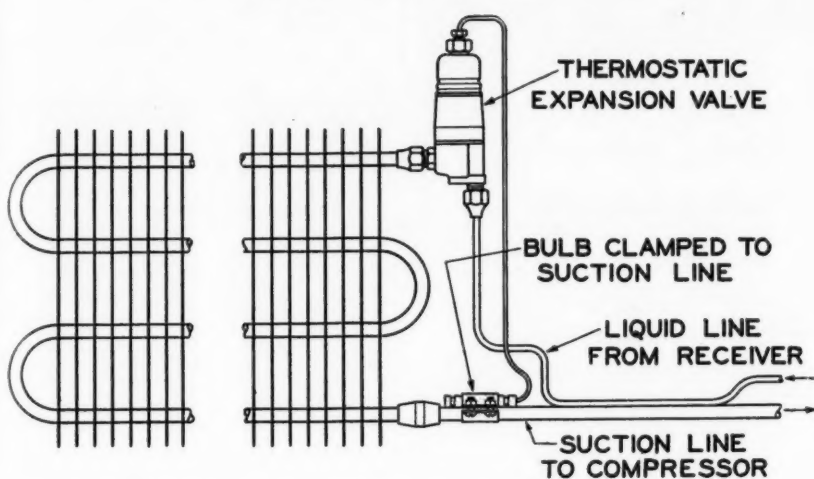


Fig. 1. Liquid line in contact with the suction line nearly up to the thermostatic bulb of the expansion valve.

Heat Exchanger Used To Increase Efficiency Of Commercial Units

By D. D. Wile, Detroit Lubricator Co.

THE past several years have seen a more general use of heat exchangers in the smaller size refrigerating installations, and the next few years will probably see this simple device in almost general use.

Simple Construction

In the simplest form, the heat exchanger is made by soldering a portion of the liquid line to the suction line for a distance of several feet. Three or four feet is sufficient for 1/2-in. suction lines, ten feet or more for large suction lines. Since the liquid and suction lines are generally run parallel, the only cost involved is the labor of soldering the two together.

Where it is impossible to solder the lines together, clamps such as used on thermostatic expansion valve bulbs can be used, but a large number will be required. Wire or friction tape around the two lines is of little use unless an excessively long run is available and the winding is done very tightly—even then the labor will probably be more than when soldering or using clamps.

One effective method of attaching the two tubes, now in use, is to wrap the liquid line around the suction line in a long spiral. This holds the tubes in close contact during soldering or tin dipping.

Improves Efficiency

The heat exchanger improves efficiency, especially when using Freon where the heat of the liquid and the superheat of the gas are comparatively large factors.

The cold gas returning through the suction line cools the warm liquid entering the expansion valve and increases the amount of refrigeration available. Thus a little additional labor during installation provides increased efficiency year after year without additional cost or upkeep.

Prevents Sweating

Since the heat exchanger warms the return gas, it prevents sweating of the suction line. This feature is especially valuable on air conditioning units where it is inconvenient to use a dryer coil, or on low temperature work. Here the heat exchanger is almost indispensable for preventing frosting or sweating return lines.

When using thermostatic expansion valves, the heat exchanger can be used to improve the close regulation of the evaporator. Fig. 1 shows a typical installation. Note that the liquid line is carried in contact with the suction line up to within a few inches of the thermostatic bulb of the expansion valve.

With this arrangement the heat of the liquid warms the bulb and tends to keep the valve open wider, maintaining thorough cooling close up to the bulb. The heat exchanger then superheats the suction gas and prevents sweating.

When the compressor is stopped the valve closes, stopping the flow of liquid and heat to the bulb. This allows the bulb to remain cool during the shut down period and insure tight closure of the valve.

Used Industrially

Heat exchangers have been widely used in power plants and on large refrigerating plants. Here the size and complication involve considerable expense. With the smaller size refrigerating units, the convenience and simplicity of a heat exchanger should not be overlooked as a means of increasing performance and efficiency.

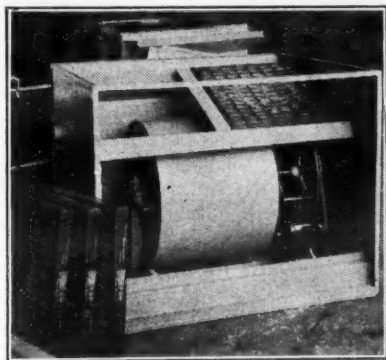
Single Unit Combines Blower and Filters

CLEVELAND—The "Air Package," a new unit for simplifying the installation of the blower and filters for an air-conditioning system, has been introduced by Air Controls, Inc.

Principal features of the new product are the combination of the blower with the filters and filter sides, and the motor and drive all included within a casing which is built with a removable panel for access to the interior parts.

The "Air Package" is shipped as a unit so that when it arrives for installation, it is necessary to make only the sheet metal and electrical connections between the "Air Package" and the cooling equipment in order to have a complete installation.

The motor is mounted on adjustable rails inside the unit at the fac-



tory and drives the blower by means of a V-belt drive. Specially designed double-width, double-inlet centrifugal blowers available in four sizes are used in each of the air packages. Rubber-mounted, self-adjusting, thermoporous bronze bearings are used.

Back Pressures Should Be Selected to Provide Highest Possible Capacity

By Marion I. Levy, Air Controls, Inc., Cleveland

ONE of the problems that confronts the designer of an air-conditioning system is the selection of the proper back pressure of the refrigerant. It is, of course, desirable to keep the back pressure as high as possible in order that the greatest refrigeration effect and highest efficiency may be obtained. But there are limitations that may not, at first thought, be apparent.

The back pressure will fix the temperature of the refrigerant in the cooling coils, which will in turn regulate the temperature of the air passing through the coil and the amount of moisture condensed out. Since the room temperature is generally 10° F. less than outside temperature, the selection of the proper back pressure therefore becomes dependent upon the outside temperature; and at this point there is a pitfall.

For the sake of discussion, let us assume that the maximum outside temperature is 98° F. A 10° reduction makes the indoor temperature 88° F. To maintain 88° F., the recirculating air might enter the room at 68° F. The refrigerant in the cooling coils could be approximately 56° to give 68° F. recirculating air. But it would never do to design the system on the basis of this set of conditions.

Suppose that the outside temperature has dropped to 90° F. and it is still desirable to have a 10° reduction for the inside temperature. The amount of refrigeration will remain unchanged, but the 80° inside temperature will allow only 12° rise in the recirculating air instead of 20° F. as formerly. This would be a reduction of 40 per cent in the amount of cooling available, despite the fact that

we still need just as much refrigeration as before.

Obviously, with this system we are not going to be able to cool the room the full 10° except when it is 93° outside. A very inflexible system, to say the least.

The solution to this is to select a cooling coil temperature (back pressure) which even at the lowest room temperature, will provide 100 per cent refrigeration capacity. Usually the coil temperature will be within the range 42 to 48° F., the back pressure depending upon the refrigerant used.

It should be kept in mind also that the cooling load includes the condensation of the moisture. This is generally greatest when the temperature difference between the air and the refrigerant is a maximum; that is, when the outside temperature is highest.

There are cases when the cooling media is at a higher temperature than desired and it cannot be changed. Such is the case when deep well water or cool hydrant water is used. In the former instance the temperature will be between 55 and 60° F., while the latter will seldom be lower than 62° F. Generally the only way to utilize this relatively high temperature water for cooling over the full temperature range is in conjunction with a two-stage air washer.

The intimate contact of the air with the water in passing through two sprays in each of the two stages will reduce the air temperature to within a few degrees of the water temperature.

By this means, even 60° water can be used successfully for summer air conditioning.

THE NEXT TIME YOU ORDER METHYL CHLORIDE



Because - -

V-Meth-L—(Virginia Methyl Chloride) is a pure product in which both moisture and acidity are reduced to the minimum.

It is refined and tested with the same exacting care that has ever characterized the production of Extra Dry ESOTOO.

V-Meth-L is convenient and economical for the Serviceman. It is ready for direct charging from orange cylinder to your machine.

Write for Folder and information.

VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

F. A. Eustis, Sec'y, Virginia Smelting Co., 131 State St., Boston, Mass.
Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.
☐ Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide) RN-5-2-34
☐ Folder: V-METH-L (Virginia Methyl Chloride)
☐ Folder: Transferring from large to small cylinders
☐ Circular: Physical properties of various refrigerants
Name
Street & No.
City & State

MAIL THIS COUPON NOW

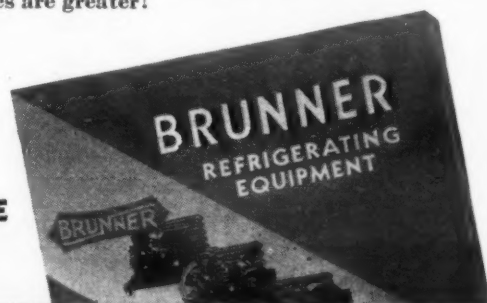


It was possible to buy high quality refrigeration equipment before BRUNNER entered the field . . . if you could afford to pay a pretty fancy price! And just as possible to get cheap equipment . . . if you were satisfied with junk! It wasn't possible to pay a medium price and get a product that equalled any on the market in quality, dependability, service! That in a nut shell, is a word picture of the BRUNNER line. Six dependable compressors, seventeen ef-

ficient highsides . . . air and water cooled units . . . gas engine or electric . . . in a range of 1/6 H.P. to 3 H.P. Send for the BRUNNER catalogue today. Study those specifications. Compare BRUNNER construction with competitive units. You'll quickly see the big point . . . BRUNNER equipment covers all markets. Naturally its profit possibilities are greater!



Send for the
BRUNNER CATALOGUE
TODAY



BRUNNER
A Name Built by 28 Years of Service

Brunner Manufacturing Co.
Utica, N. Y., U. S. A.

Send me the new
BRUNNER CATALOGUE.

Name

Address

City

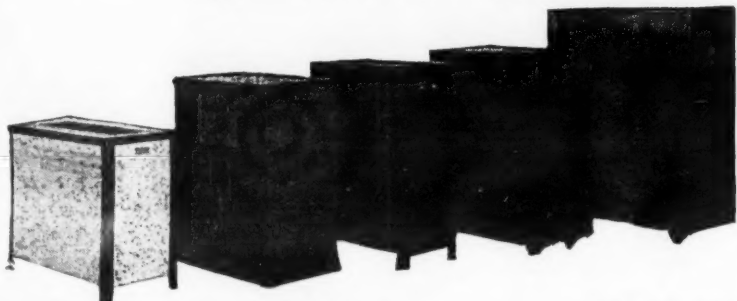
THOSE MAGIC WORDS AIR CONDITIONING

They Mean a Lot to You — If You Are on Your Toes
Just think—part of a 5 Billion Dollar Industry is clamoring for you to take it.
You can—by hitching up with us.

KAUFFMAN

AIR CONDITIONERS

Air Conditioning Units For Every Service. Priced from \$300.00.
Made from 1-2 ton to 15 tons capacity.



PRACTICAL — PROFITABLE — ECONOMICAL

The Most Complete Line of Unit Air Conditioners in America.
Self contained (portable) 1-2 ton and 1 ton capacity—floor type.

Compressor Units
1-2 to 15 ton capacity

Ceiling Suspended Units
1 ton to 7 ton capacity

Kauffman Air Conditioning Corp.

St. Louis, U. S. A.

A Few Territories Still Open. Write Today

— Air Conditioning Since 1908 —

SPECIAL OFFER

A Chance To Prove For Yourself Why Century Oil Burners Will Make You Money!

We don't want you to take our word for it. We want you to prove it for yourself . . . first hand . . . that here at last is an oil burner that will make real money for aggressive sales organizations.

Simply by mailing the coupon, you can secure details of this special offer, and learn of Century's many outstanding features.

Century has opened up the tremendous

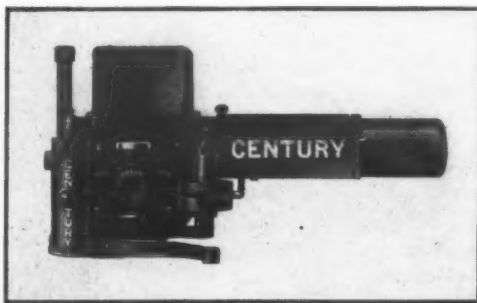
mass market for automatic oil heat. Already the Model D is one of the fastest selling oil burners in America . . . a tribute to its amazing performance. It's not only priced lower . . . in keeping with moderate incomes . . . but actually operates for less than the cost of burning coal! Thanks to Floating Flame, Century burns the cheaper grades of fuel oil . . . without waste . . . without noise . . . without smoke or soot.

EASY TO INSTALL

Then, this oil burner is so astonishingly simple in design, it may be easily and quickly installed. Service has been reduced to a minimum, because each unit, before shipment, is subjected to the gruelling Century Factory Test to prove performance and perfection.

MAIL COUPON NOW

Right now, sit down and fill in the coupon. Mail it for full details of Century's Special Dealer Offer and money-making franchise. You'll want to get into the oil burner business and cash in on the fastest growing industry in America with the best paying burner. Write today. CENTURY ENGINEERING CORP., Division 3, Cedar Rapids, Iowa.



CENTURY MODEL D with Floating Flame. One of the largest selling oil burners in America. Made of finest materials . . . along lines of utmost simplicity. Cleaner, quieter, and more economical. Actually PRICED LOWER.

CENTURY

LISTED AS STANDARD BY UNDERWRITERS' LABORATORIES

OIL BURNER with Floating Flame

MAIL COUPON NOW FOR SPECIAL DEALER OFFER

CENTURY ENG. CORP., Division 1, CEDAR RAPIDS, IOWA
Please send without obligation complete details of your money making dealer offer.

NAME _____

ADDRESS _____

CITY _____

STATE _____

REFRIGERANTS

Rhodes Tells About Installations of Air Conditioners Using Freon

By W. W. Rhodes, Sales Manager, Kinetic Chemicals, Inc.

A REVIEW of recent installations of air-conditioning equipment for both human comfort and the refrigerated storage of merchandise, in which the refrigerant Freon has been used, indicates a growing usage for a refrigerant of low toxicity and little effect on the commodities under refrigeration. Some of the interesting applications of refrigeration in which Freon is used are described below.

Freon has become popular for use in the air conditioning of fur storage vaults because it has no effect on the furs or the delicate dyes used to color them. The aviators' coats at Duncan Field, San Antonio, Tex., are stored in a vault air conditioned by Freon.

It is no new development for fruit-carrying vessels to have refrigerated holds. Formerly, such holds were refrigerated by brine coils suspended on walls and ceilings. The fruits next to the coils were cooled too much, and those at a distance not enough, and there was no fresh air entering to preserve the normal oxygen content of the atmosphere of the hold. All fruits absorb oxygen in the ripening process.

Today, the heavy and costly brine systems are obsolete. Freon in direct-expansion finned-tube evaporators is used, and the holds are truly air conditioned with moving cold air reaching every bunch of bananas or every crate of citrus fruit, keeping them all at the same temperature—the correct temperature for the particular fruit—and permitting them the oxygen for the normal ripening process.

York Ice Machinery Corp. has air conditioned the holds of the Ward-Mallory Lines' S. S. *Cherokee* and *Seminole* in this manner.

The United Fruit Co. wished to be certain that Freon had no effect on bananas. Kinetic chemists had found that it had no effect in their tests, but then there is only one set of chemists in this country who are really qualified to pass on the chemical changes in bananas. The task was assigned to G. L. Poland, chief chemist of Tropic Fruits, Inc., a subsidiary of United Fruit.

He and his assistants exposed bananas to various concentrations of Freon day by day for a period of over a year, carefully observing the fruit and testing it. They finally concluded this painstaking experiment and found Freon had no effect whatsoever on bananas.

Quickly was this work translated into usefulness. The Grace Line called in York to design their air-conditioning equipment for cooling the banana holds of their steamers, and now bananas are being loaded at Guayaquil for New York in holds air conditioned with Freon.

Freon has been selected as the air-conditioning refrigerant by every railroad in the United States for their mechanical air-conditioning equipment.

The initial decision to use it was made by Daniel Willard, president of the B. & O.

Pullman engineers who were about to build air-conditioned cars immediately recognized its ideal qualities and James Keeley, vice president of Pullman, in speaking before the City Club members in Chicago said that again was necessity the mother of invention; and it was particularly fortunate that just as the railroads were turning their attention to the air conditioning of trains, a refrigerant was found which permitted them to air condition these trains with perfect safety.

There have been built, and are building, about 2,000 mechanically air-conditioned cars. Of this number there are only four old cars containing a refrigerant other than Freon, and four containing still another refrigerant which were built for experimental purposes. The roads which built the experimental cars are now ordering Freon equipment. All the new high-speed trains built and building employ Freon refrigeration.

The most hazardous place in the world during time of warfare, and especially during battle action, is a submarine boat. It must remain submerged for long periods of time in order to escape destruction by larger fighting craft. The men are literally bolted up in a tight steel envelope and must live, work, and fight in manufactured air.

Suppose there should be a refrigerant leak while submerged. The sailors must not be affected by the leaking refrigerant, and it must not impair the cells which remove the carbon dioxide from the air.

Freon is used for the air conditioning of submarine boats and, in fact, for refrigeration on all classes of warships. Freon equipment for sub-

marines and other warships is being supplied by the Frigidaire Corp., Frick Co., and York Ice Machinery Corp.

The Boyce-Thompson Institute for plant research was founded some years ago by the late William Boyce-Thompson, a mining engineer, for the study of plants and their diseases. This institute has tested Freon on young tomato plants and found at high concentrations for periods of one to two days that it has no effect on the plants. The institute character-

New York Fire Department Issues New Regulations for F-12, F-114, & F-11

HEADQUARTERS
FIRE DEPARTMENT
CITY OF NEW YORK

CIRCULAR
No. 3
New York, April 19, 1934

The following is hereby promulgated for the information and guidance of the uniformed force:

The attention of the company commanders is hereby directed to the following rules, promulgated in accordance with the provisions of Section 216, Paragraph F of Chapter 10 of the Code of Ordinances.

When making surveys on applications for permits for these refrigerants—Freon, dichlorodifluoromethane (F-12); dichlorotetrafluoroethane (F-114); and monofluorotrifluoromethane (F-11), the company commander shall be governed by these rules.

Relative to Rule 15, they shall report in detail, in addition to information required on report form, the occupancy; when the installation was made; and the kind and location of open flame in the same room with the refrigerators. These refrigerants can be identified by a plate on the machine in the same manner, and usually in the same location as in the case of other refrigerants.

1. That the refrigerants dichlorodifluoromethane, known as "Freon" ("Kinetic No. 12") also "F-12" CCl₂F₂ also dichlorotetrafluoroethane ("F-114") C₂Cl₂F₄, and monofluorotrifluoromethane ("F-11") CFCl₃ are non-flammable and non-irritant, unless otherwise hereinafter provided, and shall be regulated in accordance with the provisions of Article 18 of Chapter 10 of the Code of Ordinances, as such, except, when used in a room or rooms in which there is an open flame or apparatus to produce an open flame, when the provisions of said article covering irritant refrigerants shall apply.

2. That refrigerating systems employing F-11; F-12; or F-114 are restricted to parts of a building so specified in Section 219 (b) for refrigerants other than non-irritant and non-flammable.

3. That refrigerating systems employing F-11; F-12; or F-114 used for air conditioning are restricted to the indirect method except that the direct method may be used in parts of a building so specified in Section 219 (b) for refrigerants other than non-irritant and non-flammable.

4. That refrigerating systems employing F-11; F-12; or F-114 shall not be installed or maintained in or on the stairways, halls, lobbies, entrances, exits, or auditoriums of any building.

5. That refrigerating systems employing F-11; F-12; or F-114, shall not be installed or maintained in a hospital, unless the entire system is confined in a fireproof machinery room, used for no other purpose, and in which no open flame shall be employed, except that the Class "C" system containing not more than 10 lbs. of refrigerant may be used in a diet kitchen which shall be cut off from the rest of the building by a tight fitting self-closing door or doors, and provided with a window or windows to the outside air. All open flames, and/or apparatus for producing an open flame, in diet kitchens where these refrigerants are used shall be vented to the outside air as hereinafter required in Paragraph 8.

6. That refrigerating systems employing F-11; F-12; or F-114 may be installed or maintained in a hospital private room, having tight partitions and tight fitting self-closing door or doors and where not more than two persons are helpless and/or given

ized Freon as a safe refrigerant for use in botanical laboratories, and purchased Frigidaire air-conditioning equipment for use in their laboratories.

Florists everywhere have found that Freon has no effect on cut flowers, and the florist's shop is one that directly benefits from minimized losses of flowers when air conditioning is employed as well as refrigerated cabinets.

The Carrier Corp. has air conditioned the greater number of rayon and other artificial silk mills in the United States. They have recently made an installation in one of the large silk mills employing F-11 as the refrigerant.

The largest air-conditioning installation in the world is just now being completed. It is in the Department of Justice building in Washington, D. C., and makes use of 1,980 tons of refrigeration. Freon is the refrigerant used. The installation is by the Cooling & Air Conditioning Corp. employing York refrigeration equipment.

Other large Government buildings equipped with systems using Freon are the Senate Office building with 330 tons, the Library of Congress with 60 tons, the Post Office Department with 1,500 tons, and the Archives building with 1,200 tons.

The U. S. Naval Hospital at Bremerton, Wash., was air conditioned by the Vilter Mfg. Corp., and areas in the Pennsylvania Railroad Suburban Station in Philadelphia were air conditioned by Frick.

medical treatment, provided there is no open flame and/or apparatus for producing an open flame in such room and when the system contains not more than 10 lbs. of refrigerant.

7. That a refrigerating system employing F-11; F-12; or F-114 shall not be installed or maintained in a theater and/or motion picture theater unless the entire system is confined in a fireproof machinery room, used for no other purpose, and in which no open flame and/or apparatus to produce such open flame shall be employed.

8. That a refrigerating system employing F-11; F-12; or F-114 when used in a room or rooms in which there is an open flame or apparatus to produce such open flame, such open flame and/or apparatus shall be provided with a hood and independent mechanical ventilation so arranged as to convey all the products of combustion to the outside of the building. This provision shall apply only to diet kitchens of hospitals and to Class "C" systems in schools, churches, dance halls, court rooms, police stations, jails, asylums, subways, passenger depots, rooms opening into passenger depots and/or subways and such other places as are deemed by the fire commissioner necessary in the interest of public safety.

9. That each refrigerating machinery room in any building in which F-11; F-12; or F-114 are used, shall be maintained vapor-tight and provided with tight fitting self-closing doors, in accordance with Section 220-1(a).

10. That each refrigerating machinery room in which F-11; F-12; or F-114 is used, shall be adequately ventilated directly to the outside air in accordance with Section 220-(2) a, b, c, and d.

11. Tests pressures and setting of safety valves for systems employing F-11, F-12, or F-114, shall be included in Section 222 (a) as follows:

Refrigerant	Column No. 1	Column No. 2	Column No. 3
F-11	25	15	15
F-12	180	120	135
F-114	60	30	30

12. That the size of pressure relief valves for systems in which F-11, F-12, or F-114 is employed, shall be as follows:

Capacity of System	Number Required
Up to 30 tons	One 1/2 inch
30 to 60 "	One 3/4 "
60 to 100 "	One 1 "
100 to 175 "	One 1 1/4 inches
175 to 250 "	One 1 1/2 "
250 to 450 "	One 2 "
450 to 900 "	Two 2 "

13. That the storage of F-11; F-12; or F-114 shall conform with Section 227-3 (e) for other refrigerants.

14. That all other sections or parts of Article 18 of the Refrigerating Code not so mentioned, shall be complied with.

15. That refrigerating systems employing F-11; F-12; or F-114, installed prior to May 19, 1932, shall be inspected, and if found to comply with the rules, or if in the opinion of the fire commissioner, the installations are of a non-hazardous character, a permit may be issued. Installations which have been made in hospitals, theaters, asylums, and other places of public assembly shall be made to comply strictly with these rules.

By order of
JOHN J. McELLIGOTT,
Fire chief and commissioner.
DAVID J. KIDNEY,
Assistant chief of department.

INSTALLATIONS

Air-Cooled Vault Attracts Tenants

(See Picture on Page 22)

NEW YORK CITY—After a season's operation the Continental Safe Deposit Co.'s air-conditioned vault, located two stories below the street level in the heart of New York City's financial district, has proven a means of attracting new tenants and retaining old ones.

Operating expenses were low, the equipment consuming only about twice as much electric power as taken for lights and other electric services in the building. This expense amounts to only a few cents per tenant and is returned many times in satisfaction and good will of customers according to Continental Safe Deposit officials.

Engineering features of this Westinghouse installation are of interest. Because thick steel wholly encloses the vault, air ducts or similar permanent openings were out of the question. The Metropolitan Air Conditioning Co. decided to take advantage of the existing ventilation system in which a blower located on the building's third sub-floor delivered filtered air through ducts to the vaults on the floor above.

The air-conditioner's condensing unit was installed adjacent to the blower. Two evaporators or cooling coils were placed within the air duct on the suction side of the blower and two others on the discharge duct located outside vault side door.

Air Goes Through Small Door

A novel system conducts the conditioned air into the vault. There are two temporary openings to the vault; a large main door at the front, and a smaller emergency door, about 4 ft. in diameter and 4 ft. thick, in the side wall.

When the main vault door is opened for business, the emergency door is also swung open. A large elbow of pipe, about 4 ft. in diameter, is then raised into position over the emergency doorway, connecting the external duct system to the vault.

From this doorway another system of ducts distributes the cooled air within the vault, discharging the air through a number of grilles located around the edges of the low ceiling. No return system is used, the exhaust air passing out through the vault's main door.

Operating Costs

Because electric current is measured by a separate meter, vault officials were able to keep an accurate record of the air conditioner's operating cost. Since put in operation in the latter part of July, 1933, it has only consumed approximately three times as much electrical current as lights, fans, electric clocks, blowers, etc., combined. Monthly invoices for electricity were:

Month Ending (1933)	BILL
Aug. 14	\$29.43
Sept. 14	90.52
Oct. 13	77.38
Nov. 14	25.65
Dec. 14	23.62

It will be seen that, from the latter part of August until the early part of October, the period during which the cooling system was in almost constant operation, the total bill was approximately three times the normal winter bill.

When completed in May, 1932, the vault was thought to have every conceivable device necessary for the

comfort and convenience of patrons. It had a system of forced ventilation to circulate the air. It even had two private elevators which directly connect the vault quarters with each of the building's 48 floors.

The vault's location, a few doors from the Stock Exchange on Broad St., is responsible for the large number of brokers among its patrons. Millions of dollars worth of stocks, bonds, and other negotiable securities are safeguarded overnight in its compartments.

Need for Air Conditioning

However, the first summer of its existence, 1932, disclosed the fact that, in spite of its ventilation system, the vault was uncomfortably warm. It was then realized that high humidity and high temperature could only be counteracted by air conditioning so the installation was made.

Tenants, both pleased and interested, asked questions. By word of mouth the news traveled until the vault's air conditioning became an attraction. Although not all of the tenants who have leased boxes since then did so only because of the air conditioning, there is no doubt that it was an important consideration.

Carrier Summarizes Installations

NEWARK—A number of orders for air-conditioning equipment have been received recently by the Carrier Engineering Corp. of this city. Among them are these:

Johnson & Johnson, hospital supplies, New Brunswick, N. J., comfort conditioning for general offices. Sale was made by the Newark branch of Carrier. Pepsodent Co., Chicago, Room Weathermaker for comfort cooling in the president's penthouse apartment. State Theater, Richmond, Va. Sale made through cooperation of the Richmond Air Equipment Co. Hiram Walker distillery, Peoria, Ill., dehumidifying and refrigeration equipment for bottling department. Bank of America, El Centro, Calif., branch, full air conditioning for banking building and two adjoining stores. Three 39E Weathermakers and three 10-hp. compressors are being used.

United States Treasury, Washington, D. C., comfort conditioning for fourth floor offices. Allen Shoe Store, New Orleans, installation will consist of a 39D Store Weathermaker and two methyl chloride compressors.

Oneida Paper Products Co., Brooklyn, air conditioning to be used in the fabrication of cellophane bags. Cluett-Peabody & Co., Troy, N. Y., air conditioning for executive offices. Price Candy Co., Kansas City, four 39E Store Weathermakers and a 56-100 compressor. Anheuser-Busch brewery, St. Louis, four 1500-series Cold Diffusers.

Universal Cools Model Home & Office

NEW YORK CITY—To demonstrate some of the new office and home equipment, Howe & Lescaze, New York architectural firm, has furnished a combination home and office at 211 East 48th St. here with air conditioning.

The establishment has two Universal Cooler condensing units (a 3-ton and a 5-ton) which serve refrigerant for direct expansion into several air-conditioning cabinets furnished by John Nesbitt of Philadelphia.

Department Store to Be Conditioned By Carrier

HARTFORD, Conn.—Carrier air conditioning is being installed in the G. Fox & Co. department store here, according to the local branch of Carrier Engineering Corp.

The installation will serve the store's basement, first floor, and first floor mezzanine, having a total working area of more than 50,000 sq. ft. Capacity of the air-conditioning system is sufficient to extend service to a fourth floor beauty parlor later.

System will handle in excess of 60,000 c.f.m. Between 200 and 250 tons of centrifugal refrigeration will be installed. The refrigerating machine is to be located under a warehouse across the street, cooled water from the machine to be pumped through a tunnel to the dehumidifier which is in the sub-basement of the store.

U. S. Leather Installs Universal System

NEW YORK CITY—Universal Cooler condensing units and unit air-conditioning cabinets furnished by Air Conditioning Industries of this city are being installed in the new office building of the U. S. Leather Goods Co. here.

The installation employs a 10-hp. and a 15-hp. Universal condensing unit which serve refrigeration to a water-cooling tank from which cold water is pumped to some 20-odd air-conditioning cabinets throughout the building. Year 'round air conditioning is provided, with a system which pumps hot water through the air-conditioning units for heating and humidification in winter.

250-Ton York System to Condition Air In Cincinnati Department Store

CINCINNATI—John Shillito Co., department store here, will place in operation about May 15 an air-conditioning plant which will be the largest single installation in the city. The system is being installed under the supervision of Edward E. Ashley, consulting engineer of New York City.

The system has a capacity of 375 tons, with three 14x10 two-cylinder York vertical single-acting fully enclosed compressor units, two of which are in a duplex unit with shafts coupled by a 300-hp. synchronous motor rotor.

Third is a simplex unit directly connected to a 150-hp. synchronous motor. Freon is used, and each compressor is equipped with 25 per cent and 50 per cent capacity reduction by-pass valves and semi-automatic control.

Central Station System

The system is of the central type, with a dehumidifier, preheaters, reheaters, and air filters; and will serve the basement, first main floor, first annex floor, arcade, beauty parlor, second and third main floors, and third floor of annex, with provisions for future extensions to serve other sections of building.

Air will be distributed through galvanized steel ducts—insulated where they pass through unconditioned spaces—using a main vertical riser with a booster fan on air supply, running through branches to each room, distribution being of the local recirculation type.

Each floor has an individual fan and mixing dampers, with automatic regulation of dehumidified and bypassed air. All temperatures in conditioned spaces are automatically controlled for both summer and winter.

The dehumidifier will be supplied with 1,500 gals. per minute of chilled water at about 45° F. The water cooler is the new York refrigerant recirculation flash type, and both cooler and condenser are of horizontal shell and tube design.

Auxiliary motor equipment consists of a 30-hp. units on the booster fan, 15 hp. on basement air supply fan, 30 hp. on air washer pump, 10 hp. on first main floor air supply, 5 hp. each on the arcade and the second and third main floor air supply, with several smaller units serving beauty parlor and annex sections. All motors are Allis Chalmers with Allen-Bradley starters.

Power is supplied from the 3-phase, 4-wire network of the Union Gas & Electric Co., which now serves all lighting and power requirements of the Shillito Co. through a duplicate transformer vault located beneath street sidewalk and served by three independent primary feeders.

The motor and control equipment and all wiring and electrical installation are being supplied by the Electric Power Equipment Co. of Columbus, Ohio.

Philadelphia Store to Be Cooled by Carrier

PHILADELPHIA—An entire block in Philadelphia's shopping district will be air conditioned when Carrier Engineering Corp. completes an installation in Blauner's, Inc. The system will serve the first floor and basement of this women's store. It is to be a standard central station system, with Carrier centrifugal refrigeration.

COMFORT COOLING CONTROL

and the

M.H.E.

MINNEAPOLIS-HONEYWELL ENGINEER

At right TWENTY TWO EAST 40th STREET BUILDING, NEW YORK CITY. Kenneth Franzheim and Walter & Gillette, Architects; Krey & Hunt, Consulting Engineers; Dwight P. Robinson, General Contractor; Cooling and Air Conditioning Corp., Air Conditioning Contractor.

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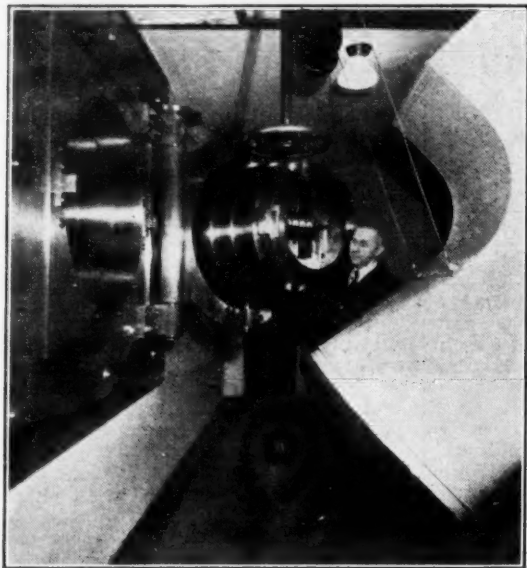
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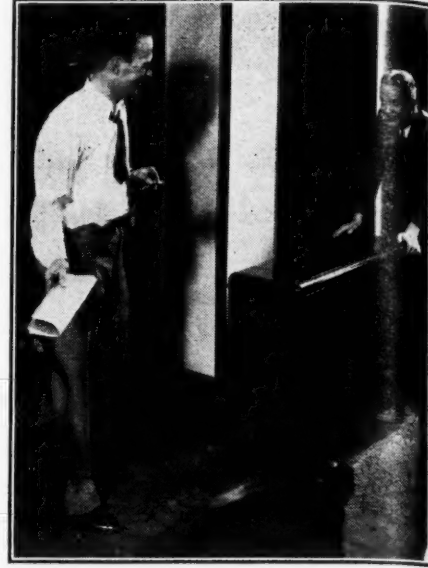
To introduce conditioned air into the Continental Bank's vault, Westinghouse devised this movable elbow (see description on page 21). The steel door is locked except during banking hours.



One of Carrier's 39-D Store Weathermakers (over the door) takes this Broadway diner out of the "lunch-wagon" class of short-order food-serving establishment.



Usable selling space was doubled in the basement of the Murphy 5-and-10 cent store in Washington, D. C., when Sturtevant air conditioning was installed (see story on page 23).



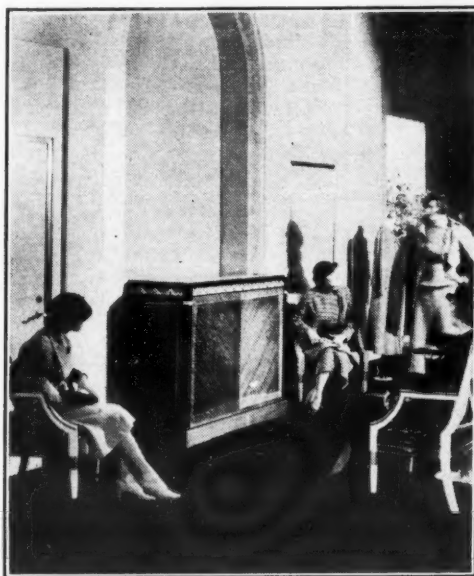
Hotel guests are expected to get considerable relief during hot weather from self-contained room coolers like the Westinghouse model above.



An Ilg room cooler (extreme left) keeps candies and customers alike in good condition in the Billy Boy Nut Kitchen, Oak Park, Ill. See story on page 23.



American Blower's steam ejector refrigeration is installed in the Rike-Kumler department store, Dayton, Ohio. Note the Sirocco cold diffuser installed in the wall.



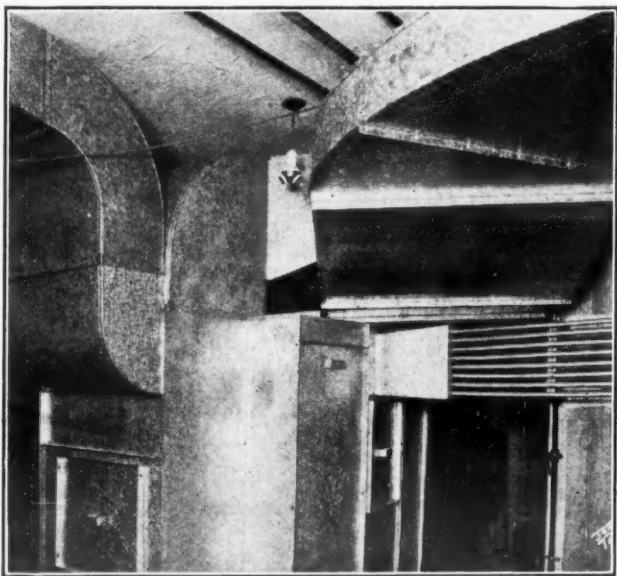
De La Vergne's air conditioner (using reversed refrigeration for heating in the winter) makes this dress shop comfortable for patrons all the year 'round.



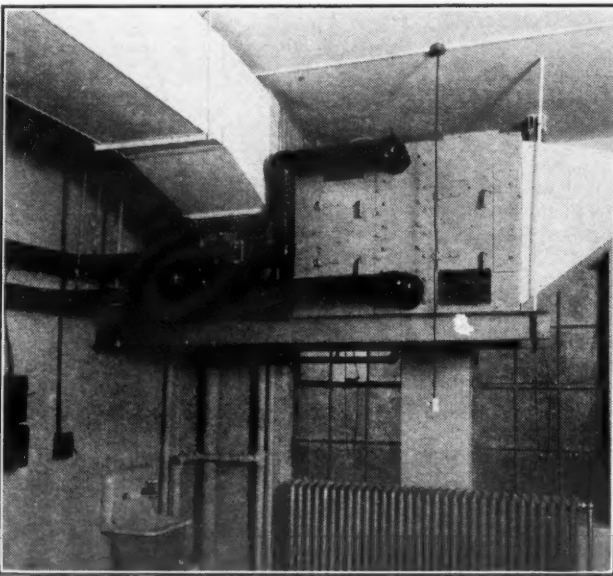
Baking room of the Washburn-Crosby Mill laboratory in Kansas City, Mo., air conditioned by the Olchoff Engineering Co., which has the agency for Frick equipment in that territory.



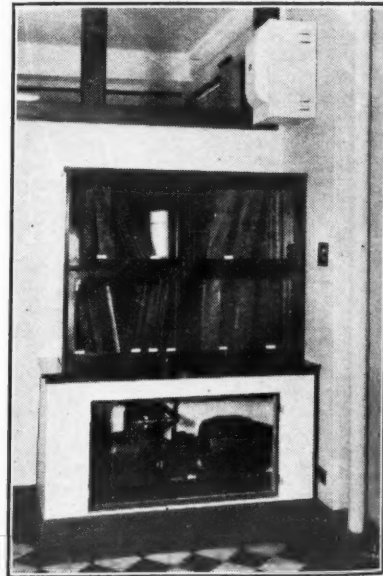
Westinghouse refrigeration installed by Metropolitan Air Conditioning Corp. to cool Continental Bank & Trust Co.'s vault (see page 21).



Neat installation of duct work in Schmidt & Bartelt's funeral home, Milwaukee, which is air conditioned by a central station system using General Electric condensing units.



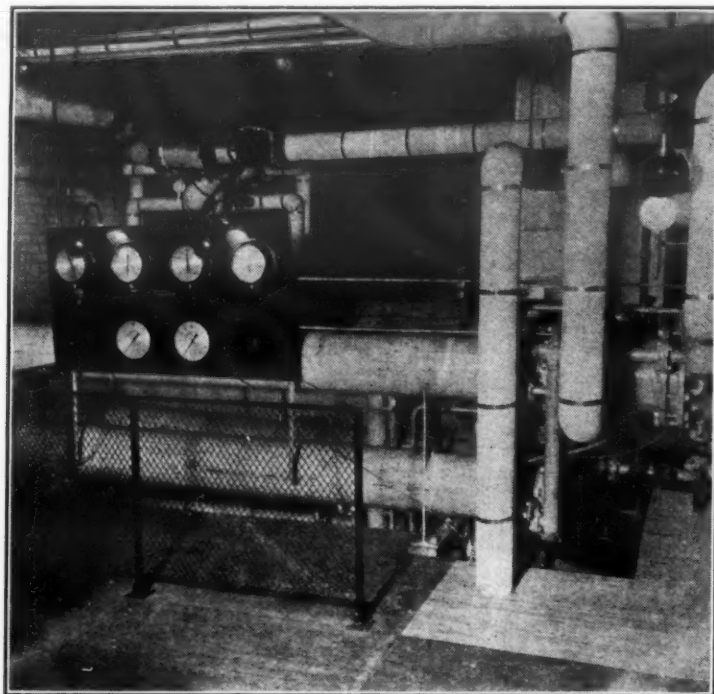
One of eight air-conditioning units in Burger Phillips department store in Birmingham, Ala. Several small units like the above permitted the use of short ducts to the discharge outlets (see story on page 23).



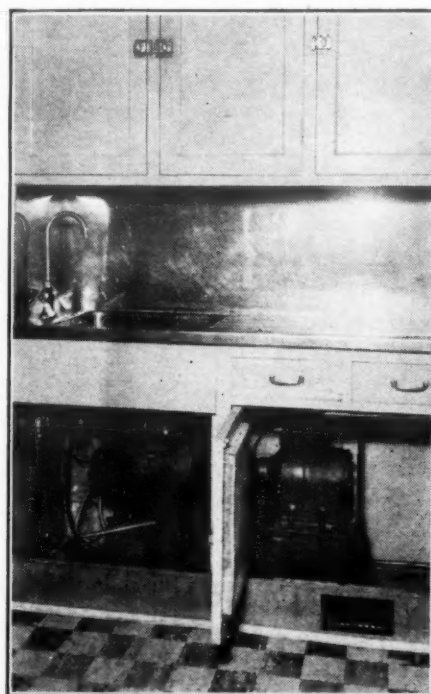
Small sound-insulated cabinet housing a Westinghouse machine which serves air conditioners in offices of the Morton Salt Co., Chicago.



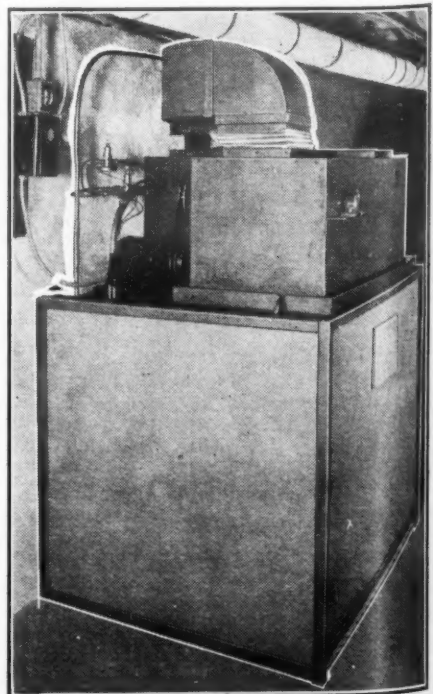
Cooling coils in ducts of this Westinghouse central air-conditioning system are located so as to be readily accessible for service and inspection.



Basement installation of the steam-ejector refrigeration system, installed by American Blower Co., which operates in connection with the air-conditioning system in the Rike-Kumler department store, Dayton. See upstairs view in top row of pictures.



Clever installation of a Westinghouse machine under the sink in the air-conditioned apartment of Aldis Browne, a resident of Chicago.



Specially designed and built by Olchoff Engineering Co., this air-conditioning system in H. F. Spencer's Kansas City home uses Frick Freon units.

INSTALLATIONS

Westinghouse Will Put 400 Floor Units In Newspaper Office

By E. N. Bowles, Air-Conditioning Division, Westinghouse Electric & Mfg. Co., Chicago, Ill.

COMPLETE air conditioning, without expensive building alterations or the utilization of rentable office space, is being installed in the architecturally famed Chicago Tribune Tower. Approximately 400 floor-mounted Westinghouse unit air conditioners will replace existing radiators in the main portion of the tower, while five centralized duct distributing systems will supply the lower floors with conditioned air.

The design of equipment, using only chilled water in summer and steam in winter, is the result of study by the Tribune management and the Kroeschell Engineering Co. of Chicago. A 600-ton steam-jet refrigeration plant will supply cooling for the entire air-conditioning system.

Steam-Jet System Used

The water for the individual air-conditioning units, as well as the centralized conditioning systems, will be chilled in the basement by the steam-jet refrigerating plant. This cold water will be distributed through the entire building by means of insulated pipes; a balanced piping system insuring an ample supply of chilled water at all points.

It is interesting that at the cold tank vacuum, 1 lb. of steam occupies a space of 2,200 cu. ft., nevertheless, the equipment is small and can be fitted into a square, or long and narrow space. The only moving parts are the water pumps.

In pumping the chilled water to the air-conditioning units in Tribune Tower, it will not be necessary to pump from the extreme vacuum as the water for these units will circulate in tubes located in the cold tanks. Variable refrigerating capacity may be obtained by opening or closing booster ejectors.

Provide Year 'Round Conditioning

Within the 400-odd cabinets, the functions of complete all-year-round air conditioning are performed. The inner casing is entirely separate from the outer decorative cabinet, to prevent moisture from forming on the outside. Air is brought in through a grilled opening at each end of the cabinet near the floor. Two specially quiet propeller-type fans handle the total volume of air which passes through a copper mesh filter.

A finned-tube coil carrying chilled water is in the path of the air and furnishes the cooling effect under typical summer conditions. Humidity is reduced by condensation of air-borne moisture on this coil, the condensate falling into the drip-pan and drain. It functions automatically, the rate of condensation being greater when the relative humidity of the air is high.

A smaller finned coil takes care of the heating in winter, and can be used with any standard steam or hot water circulating system. With 227° F. steam and 70° F. inlet air, the unit delivers 24,000 B.t.u.'s per hour.

To increase relative humidity in winter, two needle-like streams of water impinge on carborundum blocks, and are atomized, to aid evaporation. Here again the action is automatic, the air having a much greater "thirst" when its relative humidity is too low.

Under typical conditions, 3½ lbs. of moisture per hour will be introduced into the air, out of some 30 lbs. of water used. An electric switch with solenoid valve controls the humidifier, which operates only when the fans are running.

The process of refrigeration by high vacuum evaporation of water has been known for a century or more, but was first used by LeBlanc in 1898. Probably the first steam-jet refrigeration unit in the United States was the 35-ton plant installed in Swissvale, Pa., in 1918, to cool the drinking water for a large industrial plant. It is reported that this unit has given continuous service, with no repairs excepting the patching up of a water pump.

Baker Units, Trane Blowers Installed in Shoe Store

OMAHA—Berland Shoe Stores, Inc., is having its shop here equipped with air-conditioning equipment by Baker Ice Machine Co., Inc. To condition about 14,000 cu. ft. of air, two Trane suspended-type blower fan cooling units are being installed.

To supply refrigeration for this installation, Baker is installing one of its two-cylinder 3½ by 3¼-in. refrigerating machines. A feature of the Berland installation is that the grilles in front of the cooling units will be chromium plated.

Central Water Spray System Installed In N.Y. Building

NEW YORK CITY—Seven floors of the New York Trust Co. here have been air conditioned by the Cooling & Air Conditioning Corp., a division of B. F. Sturtevant Co. For this group of floors a central water spray dehumidifier was located on the sixth floor, where outdoor air connection was obtained through an existing window.

Installed in the basement of the building is a steam-jet water chilling system which at present has a capacity of 180 tons of refrigeration. The water chilling equipment is arranged so that with the addition of more steam-jet equipment the capacity can be increased to 250 tons.

Pump Chilled Water

Chilled water is pumped to the seventh floor and returned to the basement for re-cooling. All outdoor air is taken through the central water spray dehumidifier at the seventh floor and delivered by supply fan to local recirculating fans located on the other floors treated.

The Auditorium by-pass system of mixing returned and treated air is built into the local distributing and return system on each floor to obtain proper control of air delivered to the treated space, to re-heat, to fix required air conditions, and for cutting down the refrigeration capacity needed, installing engineers declare.

A total of 12,000 sq. ft. of previously unusable floor space was salvaged for office occupancy by air conditioning the seven floors of the building.

Direct Expansion Coils Used to Condition Omaha Theatre

OMAHA—Baker Ice Machine Co., Inc., will furnish air-conditioning equipment for the Brandeis theater here, an 1,100-seat house which has just been remodeled for motion pictures.

Baker equipment employed to cool the theater will develop 60 tons capacity, which will be generated by a Baker two-cylinder, 10½-in. bore by 10½-in. stroke compressor, operating with Freon. Equipment will be applied to start and stop this compressor automatically, thus controlling the temperature in the house.

Cooling will be done by finned coils of the header type, operated fully flooded. Refrigerant control will be by thermal valves, with adjustable liquid level. Separate coils will be provided for fresh air and return air, and all air will be filtered.

The air supply system will handle up to 30,000 c.f.m., and the fan motor is variable speed type, hand controlled.

5 & 10 Cent Store Doubles Basement Space with Air Conditioning

(See Picture on Page 22)

WASHINGTON, D. C.—Air-conditioning equipment installed by the Cooling & Air Conditioning Corp. has enabled the G. C. Murphy Co. 5 & 10 cent chain to double the selling space of the basement in its Washington store.

The installation consisted of a central system water spray dehumidifier with distributing ducts designed for proper air distribution without drafts to all basement space including the luncheon and refreshment counters. This was accomplished by using horizontal baffles in front of the distributing outlets.

A total of 75 tons of refrigeration effect is used in this installation. A motor-driven centrifugal vapor water chilling machine is used to supply the refrigeration. The Auditorium by-pass system of mixing recirculated outdoor and cooled air is used in the installation.

1½ Air Conditioning Used in Nut Shop

(See Picture on Page 22)

OAK PARK, Ill.—1½ Electric Ventilating Co. has installed an 1½-Kold air-conditioning system in the Billy Boy Nut Kitchen, located in this suburb of Chicago.

The system installed serves to cool, dehumidify, and recirculate the air. In this particular installation the ceiling type unit has been fitted with legs, and mounted on the floor.

Refrigeration is supplied by an 1½ compressor employing methyl chloride. Auxiliary equipment includes a type SL Penn magnetic switch and Penn water valve, type XL1.

15° Cooling Obtained In Department Store

(See Picture on Page 22)

BIRMINGHAM, Ala.—A temperature differential of 15° F. between outside and inside temperatures is maintained during the hot months in the Burger Phillips department store here by means of an air-conditioning system in which chilled water is employed in air-cooling coils.

The installation was made by Cooling & Air Conditioning Corp., a division of the B. F. Sturtevant Co.

Eight individual units, each one located to serve a particular store space, were used on this job. Each unit is in the form of a small central system plant using chilled water dry coils with the Auditorium by-pass built into the system.

The by-pass system of control enables a portion of recirculated air to be mixed with outdoor and treated air to effect a saving in refrigeration and at the same time to give proper control to air conditions required.

The installation required 80 tons of refrigeration. The refrigeration was supplied by a reciprocating compressor utilizing Freon as the refrigerant. Chilled water was pumped to the various units from a central water chilling tank.

G-E Names 3 New Dealers For Air Conditioners

SCHENCTADY, N. Y.—Three new dealers have been appointed by the air-conditioning department of General Electric Co. They will carry the complete line of equipment, including the new gas-burning furnaces. The dealers are: E. A. Barnes, Electrical Appliances, Inc., Ft. Wayne, Ind.; Waugh Brothers, Burlington, Iowa; and Hubbard Ice & Fuel Co., Cedar Rapids, Iowa.

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Exclusive Auditorium basic features and improvements produce and maintain real conditioning at extremely moderate cost for installation and operation

Write for list of authorized Central Station agents in your section or names of licensed unit manufacturers.

AUDITORIUM CONDITIONING CORPORATION
New York Office - 17 East 42nd St., New York

Copeland

Commercial Condensing Units

Each Copeland unit is compact, built for long service; efficient in operation; economical in power consumption and designed to deliver the full capacity at which it is rated.

There are 21 Copeland Commercial Condensing Units to choose from, ranging from 100 lbs. to 3250 lbs. I.M.E. per 24 hours; a unit for every purpose.

Copeland units by the thousands are giving maximum satisfaction to every type of user. They are to be found in

MEAT MARKETS — GROCERY STORES — FLORIST SHOPS — RESTAURANTS — HOTELS — CAFES — CLUBS — THEATRES — CONFECTIONERY AND CANDY STORES — INSTITUTIONS — ICE CREAM PARLORS — BEER GARDENS — FACTORIES — CREAMERIES — DAIRIES — FARMS — OFFICES

as well as in

MARINE SERVICE — and in TRUCK REFRIGERATION

In the field of Comfort Cooling and

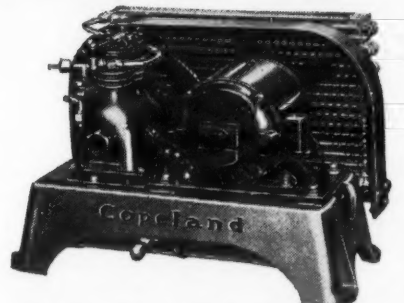
Air Conditioning

Copeland has had surprising success, particularly with Models V, X, Y and Z, which are ideally adapted to this type of work. Engineers like Copeland units because of their unfailing reliability, their freedom from service troubles and because their clients compliment them upon the entire installation when Copeland furnishes the refrigeration.

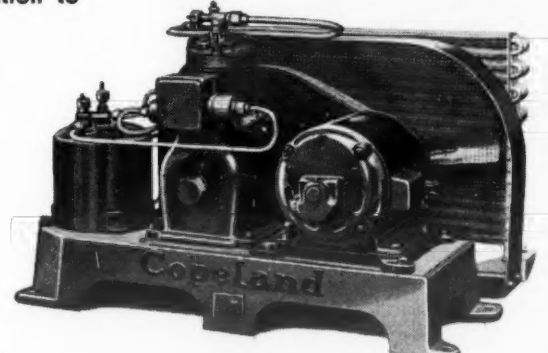
Commercial distributors will do well to investigate Copeland's complete line of Commercial Units. Some unassigned territory is waiting for the right type of distributing organizations. Write for particulars today.

COPELAND
REFRIGERATION
CORPORATION

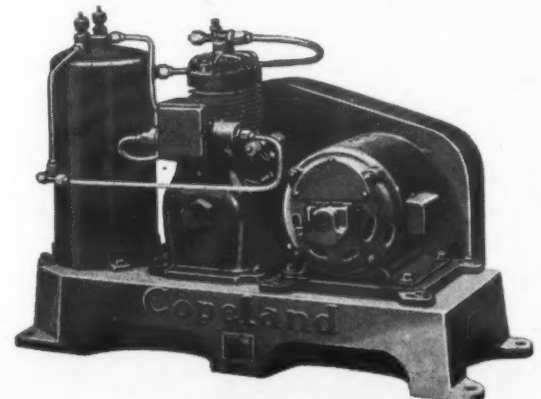
Mount Clemens, Mich.



MODEL SA—¾ H.P. Air Cooled



MODEL WA—1 H.P. Air Cooled



MODEL V—1½ H.P. Water Cooled



MODEL Y—2 H.P. Water Cooled
Z—3 H.P. Water Cooled

STATISTICS

15 Manufacturers Sell 135,470 Household Refrigerators During March

Member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reporting sales include: Crosley, Frigidaire, General Electric, Gibson, Leonard, Kelvinator, Norge, Servel, Stewart-Warner, Sunbeam, Trupar, Uniflow, Universal Cooler, Westinghouse, and Wurlitzer. Members not reporting sales are: Apex, Jomoco, Merchant & Evans, Potter, and Sparks-Withington.

HOUSEHOLD		Domestic Sales		Canadian Sales		Other Foreign Sales	
Lacquer (Exterior)	Cabinets With Systems	Quantity	Value	Quantity	Value	Quantity	Value
1. Under 4.00 cubic feet.	911	\$ 50,149		209	\$ 12,622		
2. 4 to 4.99 cubic feet.	38,171	2,379,699		653	\$ 49,551	2,686	183,712
3. 5 to 5.99 cubic feet.	18,159	1,392,000		209	18,580	561	44,019
4. 6 to 6.99 cubic feet.	19,983	1,754,056		200	17,430	1,445	137,331
5. 7 to 7.99 cubic feet.	13,738	1,452,012		29	3,242	285	30,522
6. 8 to 8.99 cubic feet.	903	109,424				79	9,075
7. 10 to 12.99 cubic feet.	40	7,841					
8. 13 to 24.00 cubic feet.	15	3,286					
9. Total Lacquer	91,920	7,139,467		1,091	88,803	5,265	417,281
Porcelain (Exterior) Cabinets With Systems							
10. Under 4.99 cubic feet.	1,946	151,714		5	397	418	36,170
11. 5 to 5.99 cubic feet.	2,515	232,574		3	246	227	21,170
12. 6 to 6.99 cubic feet.	10,334	1,127,749		8	857	186	20,481
13. 7 to 7.99 cubic feet.	9,541	1,202,206		14	1,665	226	23,208
14. 8 to 8.99 cubic feet.	3,573	500,536		10	1,326	270	23,395
15. 10 to 12.99 cubic feet.	682	119,255		5	852	85	14,685
16. 13 to 24.00 cubic feet.	194	43,481		2	455	86	18,365
17. Total Porcelain	28,765	3,377,515		47	5,798	1,398	162,474
18. Total Lines 9 and 17	120,685	10,516,982		1,138	94,601	6,663	579,755
19. Separate Systems	6,426	254,397				26	947
20. Separate Household Low Sides	290	5,212		26	367	216	3,478
21. Total Lines 18, 19, 20	127,401			1,164		6,905	
22. High Sides, 1/2 hp. or Less	263	15,205		43	2,031	573	31,828
23. Cabinets—No Systems	47	3,533		1	44	273	8,762
24. Total Household	10,795,329			97,043		624,770	
COMMERCIAL							
25. Water Coolers with High Sides	755	67,495		3	294	2	178
26. Water Coolers with No High Sides	48	2,541				7	420
27. Ice Cream Cabinets with High Sides	204	25,775		5	764	110	13,895
28. Ice Cream Cabinets with No High Sides	206	26,878		20	1,401	20	2,284
29. Beverage Coolers with High Sides	409	27,628		6	431	2	125
30. Beverage Coolers with No High Sides	111	7,568				16	911
31. Room Coolers with High Sides	6	1,800				10	3,997
32. Room Coolers with No High Sides	27	3,794				37	4,903
33. Extra High Sides, 1/2 to 1 hp. Incl.	2,242	121,403		31	2,795	1,251	95,781
34. Above 1 to 5 hp. Incl.	802	90,777		35	3,288	42	787
35. Above 5 to 10 hp. Incl.	428	57,771		41	7,344	136	35,778
36. Above 10 to 15 hp. Incl.	49	11,854				32	15,851
37. Above 15 to 20 hp. Incl.							
38. Total Lines 33, 34, 35, 36, and 37	3,521			107		1,747	
39. Total Lines 25, 27, 29, 31, and 38	4,895			121		1,871	
40. Extra Commercial Low Sides	3,092	112,178		189	6,849	1,193	42,131
41. Miscellaneous Cases and Cabinets	38	11,127		1	100	5	1,675
42. Total Commercial	*568,589			*124,566		260,116	
43. Totals—Household and Commercial	*\$11,363,918			*\$121,609		\$384,886	

*One member company did not report in breakdown form. Therefore we have added their totals to the report as follows: Line 38, 149; Line 42, \$27,429; Line 39, 163; Line 43, \$124,472.

*Two companies did not report in breakdown form. Therefore we have added their totals to the report as follows:

Line 9	38,358	\$2,715,912	44,176
Line 17	17,895	2,111,382	10,738
Line 18	56,253	4,827,294	54,914
Line 21	56,668		108,401
Line 24		4,849,414	
Line 39	5,257		3,187
Line 42	\$ 674,115	855,319	
Line 43	11,469,444	5,704,733	

15 Companies in Nema Refrigeration Division Manufacture 107,702 Refrigerators During March, 1934

U. S. A. INVENTORIES		Factory, Branch, & Warehouse		Distributors		Dealers		Production	
Lacquer (Exterior)	Cabinets With Systems	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1. Under 4.00 cubic feet.	287	\$ 14,923		305	\$ 17,461			1,003	
2. 4 to 4.99 cubic feet.	59,034	3,940,904		10,570	679,184	10,958	\$ 688,351	9,353	
3. 5 to 5.99 cubic feet.	23,887	1,907,374		9,918	407,375	3,236	245,436	14,500	
4. 6 to 6.99 cubic feet.	25,602	2,181,204		4,367	675,261	1,500	832,447	3,592	
5. 7 to 7.99 cubic feet.	25,589	2,897,471		3,521	371,861	3,274	359,577	1,861	
6. 8 to 8.99 cubic feet.	1,606	184,030		287	38,321	340	43,193	285	
7. 10 to 12.99 cubic feet.	281	53,911		154	28,912	96	17,722	3	
8. 13 to 24.00 cubic feet.	139	26,442		62	14,518	11	2,666		
9. Total Lacquer	136,485	11,306,259		*38,363	*2,232,593	27,919	2,239,392	*43,597	
Porcelain (Exterior) Cabinets with Systems									
10. Under 4.99 cubic feet.	13,094	1,172,254		968	84,066	1,360	117,924	103	
11. 5 to 5.99 cubic feet.	3,593	356,951		1,326	128,985	829	79,890	1,234	
12. 6 to 6.99 cubic feet.	11,180	1,205,299		4,367	514,432	4,862	553,019	3,082	
13. 7 to 7.99 cubic feet.	20,187	2,598,077		4,131	538,653	4,891	619,949	5,583	
14. 8 to 8.99 cubic feet.	5,071	694,227		1,717	238,927	2,243	305,327	481	
15. 10 to 12.99 cubic feet.	1,649	281,954		314	58,025	444	77,836	135	
16. 13 to 24.00 cubic feet.	1,206	291,308		274	65,621	153	33,288		
17. Total Porcelain	55,960	6,600,070		*13,097	*1,628,709	14,732	1,787,233	*10,618	
18. Total Lines 9 and 17	192,385	17,906,329		*45,460	*3,861,302	42,701	4,026,615	*54,215	
19. Separate Systems	10,809	424,398						20,453	
20. Separate Household Low Sides	11,158	172,008		405	7,504	234	3,833	33,034	
21. Total Lines 18, 19, 20	214,352			*45,865		42,935		*107,702	
22. High Sides, 1/2 hp. or Less	8,025	375,954		201	10,738	157	8,041	37,530	
23. Cabinets—No Systems	69,226	3,443,809		56	3,878	21	2,305	50,096	
24. Total Household	22,222,498			*3,833,422			4,040,794		
COMMERCIAL									
25. Water Coolers with High Sides	8,238	791,102		2,176	227,983	539	49,005	920	
26. Water Coolers with No High Sides	1,767	58,681		73	1,767	36	1,193	1	
27. Ice Cream Cabinets with High Sides	3,451	487,496		107	15,033	7	841	2	
28. Ice Cream Cabinets with No High Sides	4,468	594,744		277	32,871	19	2,852	284	
29. Beverage Coolers with High Sides	1,640	141,790		239	16,994	251	15,601	334	
30. Beverage Coolers with No High Sides	468	29,968		134	6,896	62	3,846	177	
31. Room Coolers with High Sides	19	5,700		1	523			25	
32. Room Coolers with No High Sides	1,362	150,622		223	22,435	72	7,870		
33. Extra High Sides, 1/2 to 1 hp. Incl.	8,385	728,556		1,315	117,476	581	44,619	434	
34. Extra High Sides, Above 1 to 1 hp. Incl.	2,712	375,686		643	100,607	247	31,811	317	
35. Extra High Sides, Above 1 to 5 hp. Incl.	2,197	435,556		486	186,607	144	28,099		
36. Extra High Sides, Above 5 to 10 hp. Incl.	5	3,056		3	1,992				
37. Extra High Sides, Above 10 hp. Incl.									
38. Total Lines 33, 34, 35, 36, and 37	13,299			2,447		972		928	
39. Total Lines 25, 27, 29, 31, and 38	26,647			*4,970		1,769		*2,159	
40. Extra Commercial Low Sides	27,616	919,649		3,541	128,272	1,147	33,874	3,328	
41. Miscellaneous Cases and Cabinets		259,385			98,928		12,114	21	
42. Total Commercial		4,961,983			*820,507		231,735		
43. Totals—Household and Commercial		\$27,204,461			*\$4,703,929		\$4,272,519		

*See explanation above.

Government Survey Will Show Market For Appliances in 60 Typical Cities

(Concluded from Page 1, Column 4)

Works Administration. Its purpose is to gather necessary but hitherto unavailable statistics on residential conditions, with emphasis on such subjects as degree of vacancy, condition of structure, crowding, sanitary and heating facilities, and rentals.

Several thousand "white-collar" unemployed men were utilized in gathering the information, under the general supervision of the Census Bureau.

The following data concerning Casper, Wyo., are preliminary and subject to revision:

TYPE OF DWELLING		No. of Structures	No. of Dwelling Units
Single family	3,660	3,660	3,660
2 family	255	510	510
3 family	8	24	24
4 family	50	200	200
Row house	54	302	302
Apartment	60	706	706
Other dwelling	140	217	217

AGE OF STRUCTURES		No. of Structures	No. of Dwelling Units
0-4 years		48	48
5-9 years		531	531
10-14 years		1,772	1,772
15-19 years		1,450	1,450
20-24 years		241	241
25-29 years		106	106
30-34 years		56	56
35-39 years		41	41
40 years and over		19	19

CONDITION		No. of Structures	No. of Dwelling Units
Good		1,220	1,220
Needs minor repairs		1,939	1,939
Needs structural repairs		844	844
Unfit for use		262	262

MATERIALS OF CONSTRUCTION		No. of Structures	No. of Dwelling Units
Wood		3,492	3,492
Brick		320	320
Stone		2	2
Concrete		52	52
Stucco		339	339
Other		50	50

GARAGE		No. of Structures	No. of Dwelling Units
No. of structures with garages		2,795	2,795
No. of structures without garages		1,872	1,872
Car capacity of garages		3,695	3,695
No. of automobiles		3,337	3,337

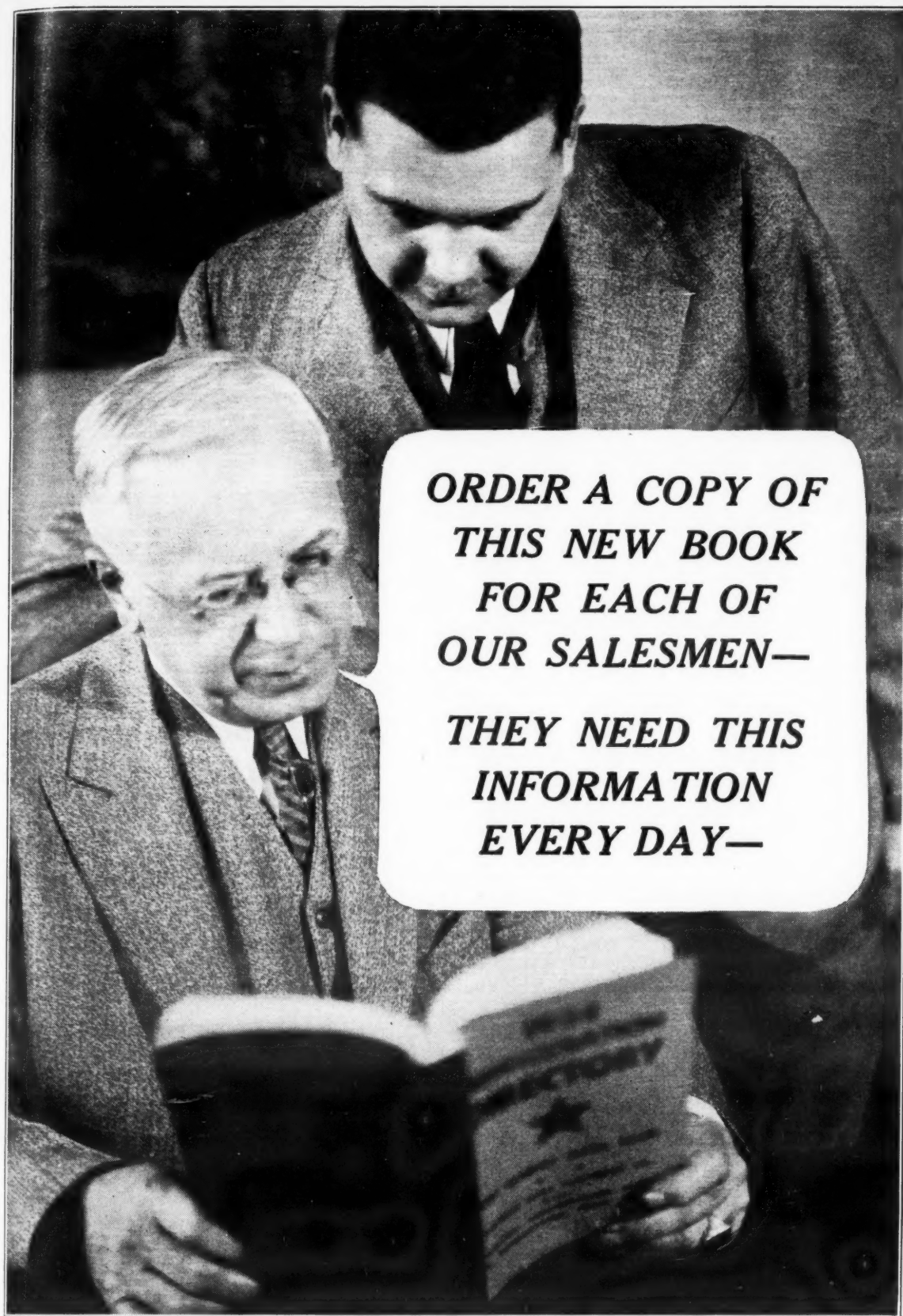
DWELLING UNITS		No. of Structures	No. of Dwelling Units
Total white families		4,826	4,826
Total families of other races		91	91
No. of extra families (two or more families living together)		124	124
Total number of dwelling units		5,618	5,618
No. occupied		4,920	4,920

ESTIMATED PROPERTY VALUE		No. of Structures	No. of Dwelling Units
No. occupied by owner		1,865	1,865
No. owned free		1,115	1,115
No. mortgaged		743	743
Under \$1,000		466	466
\$1,000 to \$1,499		217	217
\$1,500 to \$1,999		186	186
\$2,000 to \$2,999		294	294
\$3,000 to \$4,999		486	486
\$5,000 to \$7,499		168	168
\$7,500 to \$9,999		26	26
\$10,000 to \$14,999		16	16
\$15,000 and over		5	5

MONTHLY RENTAL		No. of Structures	No. of Dwelling Units
Number rented		2,542	2,542
Under \$10.00		655	655
\$10.00 to \$14.99		888	888
\$15.00 to \$19.99		541	541
\$20.00 to \$29.99		774	774
\$30.00 to \$49.99		502	502
\$50.00 to \$74.99		45	45
\$75.00 and over		4	4

DURATION OF OCCUPANCY

Time	No. of Dwelling Units
0-5 months	1,354
6-11 months	588
1-2 years	584
2-4 years	365
4-9 years	560
5-9 years	625
10-19 years	793
20 years and over	52



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THEY NEED THIS
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EVERY DAY—**

Some of the useful information contained in the 692 pages of the 1934 Refrigeration Directory and Market Data Book

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Names and addresses of all companies which sell products or services to the refrigeration industry, listed alphabetically.

Trade Name Section

Alphabetical listing of all trade names of refrigeration products or equipment identified with the product and names and address of the manufacturer.

Geographical Section

Names and addresses of manufacturers together with executive personnel, telephone number, branch offices, and products, listed by states and cities.

Classified Products Section

Products and services sold by or used by the refrigeration industry listed alphabetically in related groups with names and addresses of manufacturers.

Specifications Section

Specifications of all standard models of all makes of household and commercial refrigerators in related groups listed alphabetically by trade names.

Statistical Section

Surveys of distribution channels and merchandising activity. Air-conditioning installations. Sales of electric refrigerators and companion merchandise. U. S. Census figures, exports, survey of wired homes and potential markets, etc.

Dealer Surveys—1933

Distribution channels—Analysis of 1933 sales of electric refrigerators according to type and location of dealers.
Merchandising Activity—Analysis of electric refrigeration dealers with respect to lines of merchandise sold.

Air-Conditioning Survey

A study of installations in 12 large cities up to Jan. 1, 1934.

Household and Commercial Refrigeration Sales

An analysis of sales by months for 1933 and previous years.

Wired Homes and Potential Markets

Figures for all towns in United States of 2,500 population and over.

Review Section

Developments of the electric refrigeration industry—a brief summary of products and marketing methods.
A review of electric refrigeration news in 1933—an interpretative digest of trends and events.
Engineering progress in electric refrigeration.

Are you sure that your salesmen are supplied with all of the information they need about the refrigeration business?

THE salesman of the distributor and dealer in contact with the potential buyer of refrigeration is often stopped in his sales talk by the prospect who knows, or thinks he knows, more about a competitor's products than the salesman. If the salesman has at his ready command the specifications for all refrigerators on the market, he is in an advantageous position to combat misinformation and exaggerated claims of rival salesmen. The Specifications Section of the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK will supply all this information in handy reference form.

The salesmen who sell component parts and supplies to manufacturers will find in this new book a ready made prospect list of potential customers classified by products and grouped geographically with executive personnel, addresses, and telephone numbers. This information, together with all of the other available facts and figures on the refrigeration business, will supply the salesman with the answers to many questions about the industry at the time when he most needs this information.

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data, it is compact and arranged for quick reference. When carried in the portfolio it is always ready to serve when needed.

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Date.....1934

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Name

Attention of }
In Care of }

Street Address

City and State

We sell the refrigerator and
(Please indicate other products or principal line of business.)

The above rates apply only to United States and Possessions and Pan-American Postal Union Countries. Rate for Canada—DIRECTORY, \$6.00; NEWS, \$6.00; Combination, \$11.00. Rate for all other foreign countries—DIRECTORY, \$5.00; NEWS, \$5.00; Combination, \$9.00.

Group rates for Directory—5 copies, \$2.75 per copy; 10 copies, \$2.50 per copy; 20 copies, \$2.25 per copy
5-2-34.

PATENTS

Issued April 17, 1934

1,954,807. PORTABLE CARTON. Crosby Field, Brooklyn, N. Y., assignor to Flakice Corp., Brooklyn, N. Y., a corporation of Delaware. Original application April 16, 1928. Serial No. 270,257. Divided and this application Sept. 21, 1929. Serial No. 394,180. 2 Claims. (Cl. 62-87.)

1. A carton for perishable substances comprising a cup-like inner container provided at its rim with an outwardly projecting flange, an outer surrounding container longer than said inner container, said outer container being joined at its rim to said flange at a substantial distance from the rim of the inner container to form throughout the length of the inner container an annular space to hold a refrigerant mixture of salt and ice, caps closing both ends of said outer container, and a third container fitting within the inner container to hold the perishable substance, said third container being closed at its top when filled and the top being maintained at an interval from the top cap of the carton.

1,954,949. AIR COOLING AND AIR CONDITIONING DEVICE. Ralph C. Roe, Englewood, N. J. Application Oct. 26, 1932. Serial No. 639,671. 4 Claims. (Cl. 62-152.)

1. In an air conditioning system, an enclosure containing air, a closed container partially filled with water, an evacuating means connected with said container, a freezable substance in heat transfer relation with said water, air in heat transfer relation with said freezable substance, means for transporting said air to said enclosure.

1,955,087. REFRIGERATING APPARATUS. Lawrence A. Philipp, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application June 27, 1932. Serial No. 619,429. 7 Claims. (Cl. 62-102.)

Testing Service

for Domestic and Commercial Electric Refrigeration

Testing and experimental laboratory service for Manufacturer, Distributor, Central Station. Test data exclusive property of client.

Electrical Testing Laboratories
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Use the MASTERCRAFT REFRIGERATOR PAD and CARRYING HARNESS



They will deliver your refrigerators—

1. More easily, because adjustable features give neat, snug fit and sturdy handles make easier handling.
2. Safer, because they are strongly built and pad is heavily stuffed.
3. More economically, as adjustability feature requires only one pad or harness, and prices are

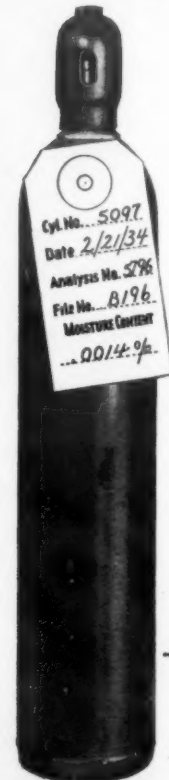
ONLY \$7.50 for Pad
ONLY \$4.75 for Harness

For quantity of four or more, 50¢ less for each. Name of refrigerator lettered on pad without charge. Prompt shipment from stock.

BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago
Phone: Belmont 8710-8711

A laboratory analysis with every cylinder of

ANSUL SULPHUR DIOXIDE
and
ANSUL METHYL CHLORIDE



Exact manufacturing methods are required to produce the high quality found in Ansul Sulphur Dioxide and Ansul Methyl Chloride.

To be certain that this high quality has been maintained, the contents of every cylinder of Ansul Sulphur Dioxide and Ansul Methyl Chloride are given a strict laboratory analysis before they leave the plant. The results of the test are placed on a tag attached to the cylinder.

Thus, you know that the Ansul Sulphur Dioxide you receive is of minimum moisture content and free from impurities. You can be certain that Ansul Methyl Chloride is of low moisture and acid content.

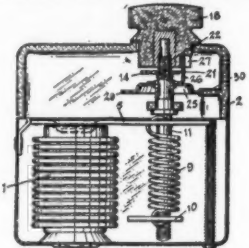
It pays to be particular. Specify Ansul refrigerants and be certain of highest quality at all times.

ANSUL CHEMICAL CO.
MARINETTE, WISCONSIN

1. Refrigerating apparatus comprising, in combination, means providing a food storage compartment and a second compartment, a low temperature refrigerant evaporator disposed in said second compartment for freezing substances, a refrigerant evaporator disposed for cooling said food compartment, said latter refrigerant evaporator having a capacity insufficient for cooling said food compartment to predetermined temperatures within a range of 33° F. to 50° F. at least under all conditions of operation by natural air convections, means for supplying liquid refrigerant to and for withdrawing gaseous refrigerant from said evaporators, a single control device responsive to changes in temperatures in said low temperature evaporator for controlling the operation of said means, and a temperature responsive fan for circulating air about said food compartment and evaporator located for cooling air therein to vary the heat absorbing characteristics of said evaporator to maintain said predetermined temperatures within said range irrespective of variations in the operation of said means.

1,955,091. INSTRUMENT ADJUSTMENT INDICATOR. Estel C. Raney, Columbus, Ohio. Application July 17, 1933. Serial No. 680,689. 12 Claims. (Cl. 200-83.)

1. In a thermo-responsive switch, means for adjusting the temperature at which the switch operates within a substantially constant temperature range, an indicator for indicating the adjustment of the switch by the said means, means for raising and lowering the temperature range and means for indicating the adjustment of the last named means.



1,955,091

the switch operates within a substantially constant temperature range, an indicator for indicating the adjustment of the switch by the said means, means for raising and lowering the temperature range and means for indicating the adjustment of the last named means.

1,955,186. REFRIGERATION APPARATUS. John W. Hill, Milwaukee, Wis., assignor of one-half to Fred A. Parsons, Milwaukee, Wis. Application Aug. 2, 1929. Serial No. 382,981. 7 Claims. (Cl. 62-89.5.)

1. A refrigerator comprising a box closed at its sides and bottom and continuously open at its top, and refrigerating means within the box uniformly distributed to avoid the creation of convection currents in box being provided at its upper margins with overhanging ledge means for protecting the air within the box from disturbances originating in the air outside thereof and the interior of the box being free of mechanically operated parts whereby the air therein is retained quiescent.

1,955,192. REFRIGERATING APPARATUS. Charles Frank Kettering, Dayton, Ohio, assignor to Frigidaire Corp., Dayton, Ohio, a corporation of Delaware. Application Dec. 30, 1931. Serial No. 583,879. 12 Claims. (Cl. 200-52.)

1. A hygrostat including hygroscopic element, a switch mechanism, power means for operating said switch mechanism, means responsive to changes in a dimension of said hygroscopic element for controlling the operation of said power means, and means connecting said switch mechanism and said responsive means for providing additional movement to said responsive means.

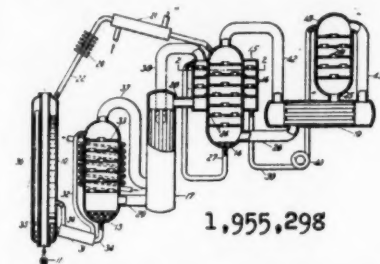
1,955,269. AIR CONDITIONING APPARATUS. Frank A. Anetsberger and William Anetsberger, Chicago, Ill. Application June 29, 1931. Serial No. 547,483. 5 Claims. (Cl. 261-9.)

1. Spraying apparatus comprising a liquid holding tank, a rotatable disc partially immersed in the liquid thereof, means for rotating said disc, a stationary receptacle adjacent the lower ascending portion of said disc into which liquid is thrown directly by said disc when rotating, a conduit for carrying liquid from said receptacle and discharging the same against one or both faces of said disc.

1,955,298. ABSORPTION REFRIGERATING APPARATUS. Donald B. Knight,

Brooklyn, N. Y., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application June 20, 1932. Serial No. 618,103. 13 Claims. (Cl. 62-119.5.)

8. The method of refrigerating which comprises, evaporating a first cooling



1,955,298

fluid, absorbing the vaporous cooling fluid into a second cooling fluid out of solution into an inert gas, and absorbing said second cooling fluid out of the resulting gas mixture into an absorption liquid.

1,955,345. ABSORPTION REFRIGERATING MACHINE. Axel Uno Sarnmark, Gottenborg, Sweden. Application May 12, 1931. Serial No. 536,855. In Sweden May 13, 1930. 16 Claims. (Cl. 62-179.)

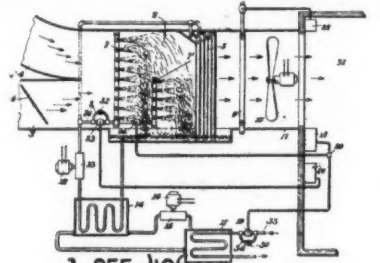
1. That improvement in the art of refrigerating through the agency of an absorption system including a generator, condenser and refrigerator connected to afford a cycle of circulation between them, which consists of expelling a cold producing medium carbon disulphide and methyl formate from a mixture with an absorption medium containing nitro benzol, in the generator, condensing the cold producing medium, and of then rapidly evaporating the liquid cold producing medium in the presence of an auxiliary gaseous medium.

1,955,381. REFRIGERATOR CABINET CONSTRUCTION. Gregg F. Forsthoefel, Springfield, Mass., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application June 17, 1932. Serial No. 617,993. 15 Claims. (Cl. 200-9.)

14. A heat-insulated cabinet for refrigerators and the like comprising an outer casing including sheet metal rear, side, top, and bottom wall panels, said outer casing serving as a frame structure for the cabinet, an inner liner supported from the outer casing and disposed in spaced relation thereto to provide a heat insulating space therebetween, and outer facing members covering the side walls of the outer casing and carried by the outer casing.

1,955,406. APPARATUS FOR CONTROLLING HUMIDITY. Willis H. Carrier, Essex Fells, N. J., assignor to Auditorium Conditioning Corp., a corporation of New Jersey. Application December 15, 1932. Serial No. 647,309. 3 Claims. (Cl. 261-115.)

3. In a system for conditioning air, means for conducting and directing a stream of fresh air and a stream of re-



1,955,406

turn air to a conditioner to substantially stratify the air in said conditioner, sprays adapted to spray the strata of return air and the strata of fresh air, auxiliary sprays adapted to spray only the strata of fresh air, a valve to control the sprays in the return air strata and a valve to control the auxiliary sprays in the fresh air strata, means for conjointly controlling said valves, and means for varying the temperature of the spray water.

1,955,612. REFRIGERATING APPARATUS. Archie Hugh Strong, Conshohocken, Pa., assignor to Master Domestic Refrigerating Co., Inc., Conshohocken, Pa., a corporation of New York. Original application Oct. 7, 1930. Serial No. 486,879. Divided and this application Aug. 14, 1931. Serial No. 557,070. 2 Claims. (Cl. 62-5.)

2. In refrigerating apparatus, the combination with main generating circuit including a generator, a condenser, and an evaporator; of heating means in cooperative relation with said generator; an auxiliary refrigerant circuit including a portion in cooperative relation with said generator; a single valve for controlling the flow of said auxiliary refrigerant in said auxiliary refrigerant circuit; a spring continually tending to open said valve; screw means adjustable to vary the stress of said spring upon said valve; and a thermostatic device in cooperative relation with said generator heating means; whereby said valve is shut, against the stress of said spring, when said thermostatic element is subjected to a predetermined temperature, at said generator.

1,955,669. REFRIGERATING APPARATUS. Otto C. Botz, Jefferson City, Mo. Application July 31, 1931. Serial No. 554,333. 2 Claims. (Cl. 62-1.)

1. A refrigerating apparatus comprising a pre-chill room, means to extract the body heat and body moisture of freshly slaughtered poultry, a freezing room connected to and in direct communication with the said prechill room, a conveyor adapted to carry the poultry to the prechill and freezing room, a packing room connected to and in communication with both the prechill and freezing rooms, and means for removing the poultry from the conveyor and directing it to the packing room.

1,955,697. REFRIGERATION. Edmund Altenkirch, Alt-Landsberg Sud, Germany, assignor, by mesne assignments, to The Hoover Co., North Canton, Ohio, a corporation of Ohio. Application Oct. 16, 1926. Serial No. 141,929. Renewed March 16, 1933. In Germany Oct. 17, 1925. 29 Claims. (Cl. 62-119.5.)

11. Refrigerating apparatus compris-

ing a generator, an absorber, means for converting gas to more dense phase, an evaporator, members connecting the aforesaid parts to form a system having circulation of refrigerant through all the aforesaid parts and a circulation circuit for inert gas between the evaporator and the absorber and a circulation circuit for absorption liquid between the generator and the absorber, said absorption circulation circuit including thermo-siphon circulation means, and said apparatus including means for conducting gas flowing from the generator toward the densifying means into direct contact with absorption liquid flowing from the absorber to the generator.

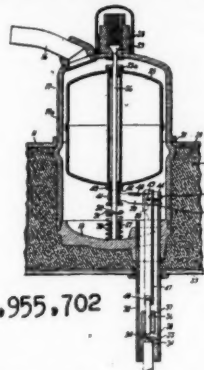
1,955,701. REFRIGERATING MACHINE. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Nov. 5, 1932. Serial No. 641,395. 15 Claims. (Cl. 62-115.)

1. A refrigerating system including a compartment to be cooled, an evaporator, a flow controlling device in said compartment, means for supplying refrigerant to said evaporator through said flow controlling device and for maintaining a body of liquid refrigerant on the supply side of said flow controlling device, means for reducing the temperature of a portion of said body of liquid to approximately the temperature of the refrigerant in said evaporator, said portion of said body of liquid and said temperature reducing means being separated from parts of said system operating at higher temperature by a body of heat insulating material.

ulating material.

1,955,702. FLOAT VALVE FOR REFRIGERATING SYSTEMS. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Nov. 5, 1932. Serial No. 641,396. 9 Claims. (Cl. 62-127.)

1. A refrigerating system including a compartment to be cooled, heat absorbing means for said compartment, a flow controlling device, means for supplying refrigerant to said heat absorbing means through said flow controlling device, said



1,955,702

flow controlling device being heat insulated from said supply means, and means of low heat conductivity for conducting refrigerant from said supply means to said flow controlling device.

Automatic Oil Separators

PRESSURE WATER REGULATING VALVES
HIGH SIDE FLOATS—EXPANSION VALVES
FILTERS—STRAINERS—DRIERS
HYDRON BELLOWS—LUBRICANTS
SOFT SEAT PACKLESS VALVES
AND OTHER ACCESSORIES

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RILEY ENGINEERING CORP.

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STARR FREEZE OUTSTANDING PERFORMANCE

attested by satisfied users
— EVERYWHERE!

Sturdy Condensing Units from 80 to 2868 Lbs. I.M.E., and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.

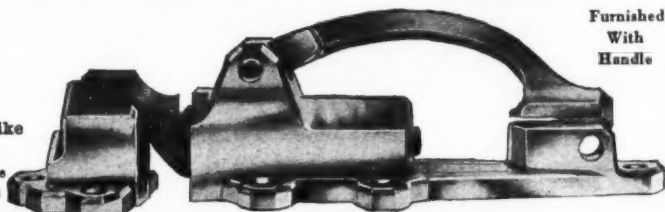
THE STARR COMPANY

Cable "Starr" Richmond, Indiana (factory) U. S. A. Since 1927
1344 S. Flower St., Los Angeles, Calif.

KASON K-54^B REFRIGERATOR LATCH

with the NEW

Patented Micrometer Adjustable Strike (Permits Offset Adjustments to the Thousandth of an Inch)



Furnished With Handle

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KASON HARDWARE CORPORATION, 61-67 Navy St., Brooklyn, N.Y.

MODEL 76 WATER VALVE

This Solenoid Valve will control full 1/2" or 3/4" flow of water for air conditioning. A very small amount of water passes through pilot valve and acts on diaphragm which causes main valve to open. All the solenoid must do is open and close the small pilot valve. Uses only 9 W. per hour. Write for details.

AUTOMATIC PRODUCTS CO.
121 N. Broadway Milwaukee, Wis.



The Dayton CARRIER Truck Deliver Your Refrigerators on Rubber

Type X has 53 inch Handles and 8 inch Rubber Wheels. Type Y has 70 inch Handles, 5 inch Rubber Wheels and skids.

Type X with one strap \$16.00
Type Y with one strap \$17.50
f.o.b. Dayton

International Engineering Inc.
Dayton, Ohio
15 Park Row — New York



Type X



Type Y

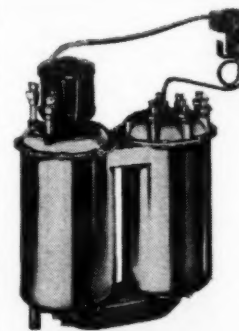
Radial Dual Control Beer Cooler

Installs in any fixture. Uses any refrigerant. Positive automatic temperature control gives accurate wide temperature range.

Available with 1 to 4 draft arms with capacity for all demands.

Write today for details on the "Radial" franchise for your territory.

Commercial Coil & Refrigeration Co.
455 N. Artesian Avenue CHICAGO Seeley 8088



QUESTIONS

Air-Conditioning Equipment

No. 1576 (Distributor, West Virginia)—"Will you furnish us with a list of reliable manufacturers who are prepared to make shipments of air-conditioning equipment suitable for domestic and commercial use?"

Answer: Manufacturers of air-conditioning equipment are listed in the 1934 REFRIGERATION DIRECTORY according to the type of function performed by their products.

Refrigerator Assembly Parts

No. 1577 (Engineer, Province de Namur, Belgium)—"Having specialized in refrigeration installations, I wish to construct the units myself, or rather assemble them by buying the compressors, condensers, valves, and accessories from larger manufacturers who specialize in these products."

"I should like to have sent to me catalogues with prices f.o.b. Anvers for each one of the following products: compressors, condensers, valves, indicating under each one all of the technical characteristics."

Answer: The 1934 REFRIGERATION DIRECTORY lists manufacturers of compressors, condensers, and valves as well as those companies making other component parts of electric refrigerators.

Absorption Type Refrigerators

No. 1578 (New York)—"Will you advise us the names and addresses of manufacturers of refrigerators of a type similar to the Superfex refrigerator made by the Perfection Stove Co. of Cleveland? In other words, we should like to obtain particulars of household refrigerators in which the cooling unit is not operated by an electric motor, but by heating process, such as the Superfex. We presume there must be other manufacturers and would appreciate highly a list of

their names."

Answer: Several manufacturers make refrigerators which use the absorption principle employed by Superfex. Crosley Radio Corp., Cincinnati, Ohio, makes the Icy-Ball absorption refrigerator. Electrolux Refrigerator Sales, Inc., of Evansville, Ind., manufactures Electrolux refrigerators of both the gas and kerosene burning types. Gibson Electric Refrigerator Corp., Greenville, Mich., also makes a kerosene burning refrigerator.

Underwriters' Report on Refrigerants

No. 1579 (Exporter, New York)—"One of our clients in Buenos Aires, Argentina, has requested us to obtain for him a copy of the new 118-page report on 'Hazards of Refrigerants' issued by the Underwriters' Laboratories, as mentioned on the front page of your Jan. 24 issue of ELECTRIC REFRIGERATION NEWS. Will you kindly obtain this copy for us, or advise where we may secure same?"

Answer: The report on "Hazards of Refrigerants" may be obtained by addressing the Underwriters' Laboratories, 207 E. Ohio St., Chicago, Ill. We have no extra copy of this report available.

Circulating Fans

No. 1580 (Wholesale distributor, Wisconsin)—"Please furnish us with the names and addresses of the manufacturers of circulating fans for low-temperature refrigeration cooling rooms. These circulating fans are found in ice cream hardening cabinets. We fear that the ordinary fan will not properly function with low-temperature work for the reason that the oil used in the ordinary fans does not properly lubricate at this temperature. Whoever constructs this fan must furnish us with proper information, specifications, data, and list prices, together with our distributor's discounts."

Answer: Circulating fans for low-temperature refrigeration cooling rooms can be purchased from these manufacturers: Clarage Fan Co., Kalamazoo, Mich. Buffalo Forge Co., 490 Broadway, Buffalo, N. Y. Emerson Electric Mfg. Co., 2018 Washington Ave., St. Louis, Mo. Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago, Ill.

Compressors

No. 1581 (Manufacturer, Detroit)—"We are wondering if you are in a position to supply us with a list of refrigerator compressor manufacturers throughout the United States."

Answer: If you are not in a position to supply the list requested, which we would like to have included with the engineering and manufacturing personnel of each company, we would appreciate your advising if you know where we could secure such a list.

Answer: Manufacturers of household, commercial, and industrial compressors are listed in the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK. Company personnel is given for each manufacturer in the Geographical Section.

Refrigerator Tray Supports

No. 1582 (Manufacturer, New York)—"We wonder if you could advise us the names of some companies who manufacture rubber-covered supports, or bakelite supports for food trays in the refrigerator. If you can furnish us with this information, it will be appreciated."

Answer: For rubber shelf supports contact Miller Rubber Products Co., S. High St., Akron, Ohio. Bakelite shelf supports may be obtained from Chicago Molded Products Corp., 2155 Walnut St., Chicago, Ill.; Continental Diamond Fibre Co., S. Chapel St., Newark, Del.; General Plastics, Inc., Walck Rd., North Tonawanda, N. Y.; and Reynolds Spring Co., Molded Plastics Div., Reynolds Bldg., Jackson, Mich.

Ice Cube Trays

No. 1583 (Heating engineer, Pennsylvania)—"Will you advise us the name and address of the company from whom we can purchase ice cube trays for a domestic refrigerator made of a metal other than aluminum. In other words, we are trying to obtain either stainless steel or nickel-plated ice cube trays to please a customer who is opposed to using aluminum."

Answer: Stainless steel ice cube trays can be obtained from McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.

Ice Making Machinery

No. 1584 (Exporter, New York)—"We have recently had a request from one of our connections abroad for ice-making machinery, and would thank you to give us the names of a few reliable manufacturers of such equipment."

Answer: Manufacturers of ice-making equipment are listed in the 1934 REFRIGERATION DIRECTORY.

Commercial Sales by States

No. 1585 (Manufacturer, New York)—"In looking through the 1934 REFRIGERATION DIRECTORY, I cannot locate any statistical information giving commercial sales by units by states. Do you have this information? I am very anxious to have the data if you

are in a position to supply same."

Answer: No breakdown of commercial unit sales by states is available. Considerable difficulty has been experienced in obtaining commercial statistical data, but another questionnaire will be directed to commercial equipment manufacturers within a short time. Its purpose will be the securing of more complete and detailed data on commercial sales made during the past few years.

Crosley Dedicates New Station Today

CINCINNATI, May 2—Formal dedicatory exercises of the world's most powerful radio broadcasting station—500,000-watt WLW, owned and operated by Crosley Radio Corp.—have been scheduled for today.

At exactly 9 o'clock tonight the voice of Powel Crosley, Jr., founder of the Crosley Radio Corp., will be carried into every corner of the earth as he inaugurates WLW's full-time operation on a power of half a million watts.

More than 500 distinguished guests will be present at the ceremonies. Included among those expected to be present are the governors of several mid-west states, members of the Federal Radio Commission, United States Senators from Ohio and prominent newspaper publishers, business and professional men. Hon. Charles Sawyer, Ohio Lieutenant Governor and a director of the Crosley Radio Corp., will act as toastmaster.

More than 200 artists, entertainers and musicians are to make their appearance on the broadcast which will formally usher the new 500,000-watt station into regular operation. The entire program will originate in the Hall of Mirrors, Netherland Plaza hotel, save for a half hour's congratulatory NBC network program originating in New York at 10:30 o'clock.

Four nationally known WLW staff orchestras will head this galaxy of radio stars—all exclusive WLW artists—during the first section of the dedicatory program, from 9:00 to 10:30. These include the Crosley Symphony Orchestra under the direction of William C. Stoess, WLW director of music; Henry Thies and his orchestra; Virginio Marucci and his South Americans; and the Flying Dutchmen directed by Phil Davis.

Individual artists listed on the program will include such favorites of the air as Margaret Carlisle, the Ponce Sisters, John Barker, Mary Alcott, the Charlottees, the Rhythm Jesters, Johnny Muldowney, Joe Emerson, Sandra Roberts, Flora Blackshaw, Carl Grayson, Charlie Dameron, the Crosley Male Four, Jack Berch and Oklahoma Bob Albright. The Crosley Glee Club of 35 male voices will also have a part in the program.

Following the network broadcast from the NBC studios in New York, the program will return to the Hall of Mirrors in Cincinnati at 11:00 p. m. for another hour's entertainment. The program will then be switched to the WLW studios and will be continued until the small hours of the morning for the benefit of the western listeners on the Pacific Coast, Hawaii, the Philippines, New Zealand, Australia and other sections where the time is several hours earlier than Cincinnati (Eastern Standard) time.

The broadcast of the dedicatory exercises will be the most elaborate remote control pick-up of its kind in the history of radio. Twenty-eight engineers, 12 microphones, and more than 7,000 feet of wire will be required for the broadcast.

WLW Granted Authority To Operate 500-KW. Broadcaster

CINCINNATI—Authority to operate the giant new 500,000-watt WLW transmitter regularly over that station's cleared channel of 700 kilocycles has been granted the Crosley Radio Corp. by the Federal Radio Commission, according to advices received here by Powel Crosley, Jr., president of the Crosley company.

The Federal Radio Commission's action in granting a full-time operating license to the 500-kw. WLW transmitter was made following weeks of careful study and checking results of exhaustive tests of the new transmitter during the past three months.

10,000 Salesmen Attend 51 Norge Meetings

DETROIT—A check-up on the attendance at the 51 Norge dealer meetings held during February and March under the direction of factory sales teams showed that total attendance at these meetings was more than 10,000 dealers and salesmen.

Two sales teams conducted the meetings. One group in charge of John H. Knapp, vice president of Norge Corp., covered the eastern half of the United States, traveling approximately 6,000 miles; while the other group under the direction of James A. Sterling, advertising and sales promotion manager, traveled some 10,000 miles through the West.

CLASSIFIED

PAYMENT in advance is required for advertising in this column.

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

REPLIES to advertisements with box numbers should be addressed to the box number in care of Electric Refrigeration News, 550 Maccabees Bldg., Detroit, Mich.

EQUIPMENT FOR SALE

FOR SALE: 100 fine, new conventional reciprocating compressors with flywheel, valves, and gauge for SO₂ or Methyl. Bore 1½", stroke 1½", speed 400 R.P.M. Overall height 14½". Photograph available. Price \$6.50 each in lots of six and less for entire lot. Frantz-Carroll Systems, Hanna Building, Cleveland, Ohio.

FOR SALE. Bargain lot of 150 new Fedders domestic evaporators in original cartons. Type S-27, 3 tray—6 c. f.—\$9.39. S-32, 4 tray—6½ c. f.—\$10.95. L-28, 2 tray—5½ c. f.—\$10.90. Complete with trays. For SO₂ use. Reliable Refrigerator Company, 39 East 19th Street, New York, N. Y.

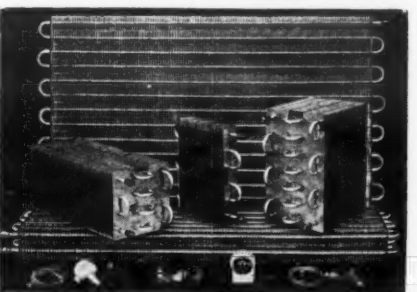
FRANCHISE OPEN

LAST CALL for dealers to handle repossessed and reconditioned refrigerators of all makes for one of the largest wholesale jobbers in the United States. 10,000 refrigerators available for the coming season, all guaranteed. Some territories still open. Wonderful opportunity for the right people. We also have several hundred new refrigerators in crates at attractive prices. Keystone Refrigerator Exchange, Inc., 479 First Ave. corner 28th St., New York City.

INDEPENDENT SERVICE COMPANIES

HALETRIC Thermostat repair service. Ranco, B & B, Two dollars each, one year guarantee, prompt service. Haletric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

INDEPENDENT SERVICE COMPANIES: You can profitably use this column to tell Refrigeration Manufacturers who you are and where you are. Write for special rates for service companies.



REMPE SUPER COLD FIN COILS

COPPER ALUMINUM STEEL FINS

DISTRICT REPRESENTATION WANTED

WRITE REMPE FIN COIL CO. 340 NO. SACRAMENTO BLVD. CHICAGO

McCORD REFRIGERATION PRODUCTS

COMMERCIAL EVAPORATORS

DOMESTIC EVAPORATORS

CONDENSERS

METLFLEX ICE TRAYS

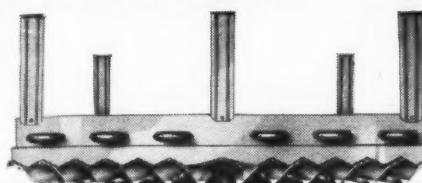
SPIRAL FINNED TUBING

SPIRAL COPPER FINNED IRON

STEEL OR COPPER PIPE

McCORD RADIATOR & MFG. CO. DETROIT, MICH.

PEERLESS FLASH COOLER



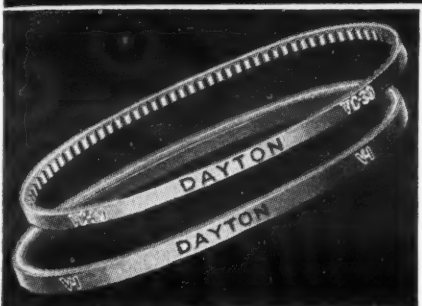
The NEW Eye Appealing Method of Cooling Walk-In Refrigerators

STYLE & RESULTS

Fin Coils and Drip Pans Engineered in an Integral Unit—Saves Installation Cost and Operating Cost

PEERLESS ICE MACHINE CO. 515 W. 35th St. Chicago

DAYTON V-BELTS

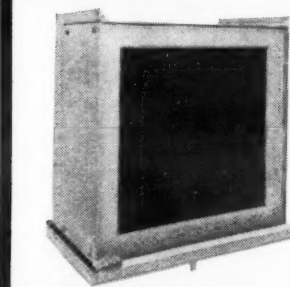


There is a Dayton V-Belt for all makes and types of refrigerators. A stock is available near you. Send for price list and name of your nearest distributor.

THE DAYTON RUBBER MFG. CO. DAYTON, OHIO

The world's largest manufacturer of V-Belts

KRAMER TURBOFIN UNIT COOLER



All copper construction. Made in five sizes, ranging from 20 to 80 lbs. hourly I.M.E. Housing of sheet brass construction.

Also COMMERCIAL EVAPORATORS for all Refrigerators, DOMESTIC EVAPORATORS, CONDENSERS, SHELF COILS with fins or bare.

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THE TRADEMARK OF FOUR
PACE SETTERS
IN COIL EFFICIENCY

SUR-E-FEX	Fin Coils
FAN-E-FEX	Diffusing Units
HUM-E-FEX	Non-Dehydrating Coils
AIR-E-FEX	Air-Conditioning Units

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H. J. KRACKOWIZER, Pres.
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REPAIRS		REPLACEMENT PARTS	
B & B Household Controls.....	\$2.50	Howell Special Capacitor Type	
Penn Household Controls.....	2.50	¼ HP Refrigerator Motor.....	\$11.00
Penn Commercial Controls.....	4.50	Amer. Rad. Household Exp. Valve..	4.50
Amer. Rad. Household Exp. Valve..	2.50	Amer. Rad. Multiple Exp. Valve....	7.50
Amer. Rad. Multiple Exp. Valve....	3.50	Penn Commercial Controls	\$8 & \$12.00
Apex Water Regulating Valve.....	3.50	Iso Butane (Freon) Per lb.....	1.25
Penn Water Regulating Valve.....	3.50	Methyl Chloride, Per lb.....	.70

We also carry a complete stock of Gilmer Belts, Penn Water Regulating Valves, Glass Defrosting Trays, Lead and Fibre Gaskets Etc. WRITE FOR PRICES.

Forty Eight Hour service on repairs, immediate shipment on replacements. All Repairs and Parts guaranteed to be free from defects in Workmanship, and Material for ONE YEAR.

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418-20 Bush Street

To Move Refrigerators . . . with Greatest Ease . . . Use a Balance Truck

Also ideal for heavy boxes, crates, stoves and furniture. Padded nose piece has instant, exact adjustment. Price \$25. Write today for details. Manufacturers of the Heavy Duty Caster X-70 Refrigerator Trucks and eleven styles of piano trucks.



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